The EMS Authority's Special Grant Program

The Health and Safety Code (Sec. 1797.200) permits a county to develop an EMS program. Each county developing an EMS program must designate a local EMS agency, which may be the county health department, an agency established and operated by the county, an entity with which the county contracts for the purposes of EMS administration, or a joint powers agency. Funding of local EMS agencies is generally the responsibility of the county establishing the EMS program. In California, the development of EMS systems has been varied as a result of the state's large size, geographical features, diverse population distribution, and differing availability at the local level of adequate finances and other resources. In an effort to promote the development and maintenance of EMS systems, some state and federal funding is available to assist local EMS agencies in maintaining, developing, improving, and evaluating local services.

The EMS Authority administers two local assistance funding programs. They are (1) the State General Fund and, (2) the Federal Preventive Health and Health Services (in California called Prevention 2000) Block Grant.

Prevention 2000 Block Grant funds (approximately $1.8 million) are allocated to local EMS agencies annually for special projects to develop, implement, and improve local and state EMS capabilities.

Special Project Grant Selection Process

The EMS Authority utilizes a competitive grant selection process. Proposals are sorted and reviewed by target areas to allow an organized and equitable review process.

A review committee consisting of 3-6 reviewers drawn from the EMS community convenes in Sacramento. The committee consists of EMS administrators, medical directors, and subject experts as determined by the EMS Authority. Individuals do not serve on a target area committee for which their local EMS agency has submitted an application. There is one primary and one secondary reviewer for each grant application. They review in depth and present the project to the whole committee. All reviewers receive copies of all of the proposals being reviewed by the committee.

The reviewers make ranked recommendations for funding of projects and provide written comments on each proposal to the EMS Authority.

The EMS Authority makes the final selection of projects to be funded. Funds are allocated according to the ranking of the proposals. Amounts allocated are related to the appropriateness of the budget, the potential benefit, and the availability of funds.

EMS Authority provides a summary of the review committee's comments (positive and negative) for each proposal to help applicants improve future proposals for funding.

With respect to Special Project Grants, it is EMSA's goal to continue the funding stream to local EMS agencies. The specific use of these funds are to assist local EMS agencies to improve underdeveloped EMS system components.

It is also our goal to improve the transferability of projects, by examining the statewide application of proposed projects. We wish to reduce the reliance upon special projects to augment local EMS agency budgets.

The EMS Authority distribute abstracts of projects annually and will continue a participatory review of grant submissions to meet these goals.

Section I of the Abstract Report contains the Abstract Reports from FY 95/96.

Section II contains the Abstract Reports from FY 96/97.

SECTION I

SPECIAL PROJECT ABSTRACTS

1995/96 SFY GRANTS

Poison Control Study

Grantee:
Contra Costa County EMS Agency
Project Number: EMS-4042
Project Period: 06/25/95-06/30/97
Project Amount: $46,000.00

EMS Administrator:
Art Lathrop
50 Glacier Drive
Martinez, CA 94553
(510) 646-4690

Introduction

A reduction in funding and a failure to find alternative funding left Contra Costa County residents without the services of the San Francisco Poison Control Center (SFPCC) from August 4, 1993 to November 1, 1994 (they were blocked from calling the SFPCC). This study is the second year of a three-year project funded by a special grant from the California EMS Authority. In essence, the entire study entailed researching alternative poison control models nationwide and designing a pilot study for Contra Costa County (Year One), implementing the pilot study for managing poison control calls (Year Two) and evaluating the study's effectiveness (Year Three). Given the overall structure of the study and timing issues, there has been some overlap between Year Two and Three.

As a result of the findings in Year One, a data driven analysis of the impact of this 14 month call blockage on emergency departments (ED) in Contra Costa County was initiated. Six months of ED logs were reviewed to determine if there was a significant change in visits.

Project Description

The purpose of this study was to assess two alternative programs by comparing them to a poison control center in managing, triaging and screening poison calls. The following organizations agreed to participate: The Contra Costa Health Plan's (CCHP) Advice Nurse Program; the San Ramon Valley Fire Protection District (SRVFPD); and the Fresno Poison Control Center. This study evaluated the two alternative models to determine their ability to effectively and accurately manage poison calls by comparing them to the "traditional" poison control center provider.

The ED Log Review entailed reviewing three hospital's ED logs in Contra Costa County for a six-month period to determine if there was a significant change in the number of visits experienced by the EDs as a result of the 14 month period when Contra Costa County residents were blocked from calling the SFPCC. During Year Two of the Contra Costa County Alternative Model Poison Control Center Study, the data for the EDs were recorded, requiring approximately 45 hours of labor, and then entered into a spreadsheet software program to enable analysis. The analysis of the data occurred during year Three of the Study and is included in the Year Two Final Report as Exhibit 1. The data found there was no significant change in the ED visits to hospitals in Contra Costa County during the call blockage.

The study was conducted by the Abaris Group, with the assistance of the San Francisco Poison Control Center (SFPCC), on behalf of the Contra Costa County EMS

Agency and the State of California EMS Authority.

Tasks/Methodology

Poison call scenarios were drawn from the SFPCC's past case histories and developed to assess the alternative agencies in their screening of poison calls. In order to objectively compare the sites, each used the resource, Poisindex®, as the resource of poison information. During a scheduled day and time period, the participating site called the Abaris Group to receive their scenarios (or "simulated" calls). The calls were tape recorded to allow retrospective assessment.

Upon assessment by a non-poison control center specialist (ED registered nurse) and a poison control center specialist (toxicologist) the data were entered into a spreadsheet software to enable analysis and evaluation.

Outcomes

The data produced will allow for detailed analysis and evaluation to assess whether or not it is feasible for an alternative site (or non-poison control center) to appropriately answer different types of poison calls instead of the traditional poison control center site.

Conclusion

Based on the number of points available for each type of call, each participant needed to receive at least 2/3 of the total points (or 66 percent) in order to pass. If the participant received less than 2/3 of the points it was considered a fail. Additionally, the participants automatically failed if they met the prespecified automatic fail criteria. In cases of automatic failure, the participant received zero points.

Table 1 provides the total points possible for each call type and the number of points required to pass.

Table 1

Call Type	Points Possible	Points Required for Passing
Information	3	2
Non-Toxic	6	4
Potentially Toxic	12	8
Fatally Toxic	18	12

Based on each group attaining at least 66 percent of the total points, all three groups passed. The total pass/fail ratio for each participating group by assessor was comparable for the PCC group and less comparable between the 911 Dispatch and Advice Nurse groups. However, both groups exceeded the 66 percent needed to pass.

Table 2

Contra Costa County Alternative Model Poison Control Center Study

Percent Pass/Fail for All Calls by Participant

	911 Dispatch		Advice Nurses		PCC	
	Pass	Fail	Pass	Fail	Pass	Fail
Assessor A	71%	29%	79%	21%	94%	6%
Assessor B	79%	21%	74%	26%	97%	3%

Regional Disaster Medical Health Coordinator (RDMHC)

Grantee:
Fresno, Kings, Madera EMS Agency
Project Number: EMS-4045
Project Period: 06/25/95-06/25/96
Project Amount: $30,000.00

EMS Administrator:
Dan Lynch
P.O. Box 11867
Fresno, CA 93775
(209) 445-3387

Introduction

Region V includes the counties of Kern, Tulare, Kings, Fresno, Madera, Merced, and Mariposa. In addition to these seven counties is Yosemite National Park, and the Kings Canyon and Sequoia National Parks. Fresno County is the coordinator for the Region V, RDMHC Grant. Currently, the preparation for response to medical disasters was the responsibility of individual agency's and providers. The Fresno/Kings/Madera EMS Agency is developing the role of the RDMHC to coordinate the resources and functions within Region V.

Project Description

The purpose of this project was to continue the development of the RDMHC and further development of plans, procedures, and linkages within OES Region V. The goals and objectives were implemented to organize the infra-structure of the RDMHC and identify the resources in each of the seven counties. Once these resources were identified, the Regional Disaster Medical Health Plan and Medical/Health Mutual Aid Plan could be developed and drafted for distribution to the counties in Region V. A planned exercise could then be completed to test, educate, and prepare the region for potential disaster responses.

Tasks/Methodology

The administration of the Regional Disaster Medical Health Coordinator Project was coordinated by the Fresno/Kings/Madera EMS agency staff. Staffing included both a project coordinator and funded a half-time EMS specialist within the EMS Agency.

The project set an objective to continue to develop, update, and distribute an annual listing of disaster medical resources within OES Region V. A questionnaire was developed and distributed to appropriate agencies, facilities, and individuals to address the resource directory as well as the EMS Plan. Many questionnaires were received and the information was input into the resource manual. The document will be distributed when the information is complete.

The Regional Disaster Medical Response Plan was refined through the review of the existing OES Region V Plan and other plans from other OES regions. Health Officers and other officials were identified in each county to discuss the refinement of the plan. Discussions with the RDMHC and State and Local representatives were facilitated to define the roles of the RDMHC staff for inclusion in the Regional Disaster Medical Response Plan. The Plan was also modified to include SEMS requirements.

Another task which was undertaken through the project was to facilitate the organization and implementation of a table top exercise of the Regional Disaster Medical Response Plan on a local/regional basis. Multiple drills were performed locally with local hospital and provider agencies. The EMS Agency remains active in MARAC and LEPC.

Outcomes

The Regional Disaster Medical Response Plan was developed in draft and distributed throughout Region V. The new SEMS requirements were included in the draft and some RDMHC staff attended SEMS training courses. In addition, the EMS agency also developed plans for the integration of HEICS into all area hospitals, as well as disaster communications. Disaster resources were identified throughout the entire Region V and data was input into a computer for the development of the Disaster Medical Resources Manual. Local drills and exercises were conducted to identify potential issues in preparation for more regionalized exercises.

Conclusion

The RDMHC project has given the EMS agency opportunity to standardize disaster response throughout the entire seven county region of Region V. The project will continue to improve the preparation and response to potential disasters through the fostered relationships with neighboring EMS agencies and the Office of Emergency Services at the state and local levels.

Information Management System

Grantee:
Fresno, Kings, Madera EMS Agency
Project Number: EMS-4046
Project Period: 06/25/95-06/25/96
Project Amount: $74,990.00

EMS Administrator:
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Introduction

This grant project was for the continuation of the development of a data management system. As a Multi-County EMS Agency, there was a need to standardize policies, procedures and protocols in order to evaluate the EMS System and its components. Without the data link in place for the three counties, it was very difficult to measure the needs and changes that were being implemented. The certification and accreditation process accounts for approximately 3000 certifications annually which has been completed under a manual system.

Project Description

The purpose of this project was to continue to provide technical support and necessary services and supplies to integrate the existing EMS information management system, and scheduled upgrade, with other existing medical databases at hospitals throughout the EMS Region. The data integration was utilized to facilitate the review of patient outcome and support the quality improvement function of the EMS Agency. The project builds upon the current information management system through a review of existing medical databases at fifteen area hospitals. Eventually the system will allow for electronically downloading information from these hospitals to the EMS agency in order to track patient outcome for patients delivered by the prehospital system.

The certification and accreditation process was conducted under a manual system and computerization of this very important task was necessary for the effective coordination of personnel. Once completed, the EMS agency will be able to provide notices of expiration and other information associated with certifications.

Tasks/Methodology

The project was administered through EMS agency staff and the appropriate staff were trained and oriented to the project. In order to meet the goals of the project, it was necessary to develop a mechanism for obtaining patient outcome on all patients transported to hospitals within the Fresno, Kings, Madera EMS Region. To accomplish this task EMS staff identified the specific data elements required to be captured and current hospital data needed to be assessed for identification of the appropriate format. A procedure was then developed with the proposed format for the data collection and integration of the data.

Once data was able to be captured, a mechanism was established to link the prehospital data with the dispatch data and eventually with the hospital data for patient outcome information. In the future, the

database would also include EMT-D and trauma audit information. A mechanism for the linkage of hospitals, provider agencies, and the EMS agency for the purpose of reviewing and monitoring quality improvement activities is under development. Software and data collection mechanisms needed to be evaluated for the purpose of integration into the system as well as the need for confidentiality of the system information.

The final objectives were to develop the mechanisms for monitoring bed inventories at all hospitals in the region and to implement a computerized certification/accreditation application process.

Outcome

Through this project, the EMS agency now has the capability to produce effective regional reports on prehospital issues for the sole purpose of quality improvement. The data collected reveals the entire scope of an incident beginning from the time the call is received at the dispatch center to the care and outcome at the receiving facility. Reports can be generated to measure the increments of time on cardiac arrest which deal with downtime to defibrillation and extending into ALS arrival. The computerization of the certification application process allows the EMS agency the ability to identify currently certified personnel and issue notices of expiration to personnel.

Conclusion

The EMS agency has been successful in implementing an information management system that allows for the electronic storage of prehospital care data. In addition, prehospital care data has been successfully integrated with dispatch data, EMT-D data, and trauma audit information. The system is capable of providing necessary reports for the day to day evaluation of the EMS system and the capturing of potential quality assurance issues. The computerization and the electronic collection of prehospital and certification data has allowed the EMS agency a more informed and organized approach to managing the EMS system.

Rural System Development

Grantee:
Imperial County EMS Agency
Project Number: EMS-4047
Project Period: 06/25/95-06/25/96
Project Amount: $50,000.00

EMS Administrator:
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El Centro, CA 92243
(760) 339-4468

Introduction

The EMS Agency is facing grave challenges to the provision of prehospital care in Imperial County. The recent fiscal restraints placed upon fire services have resulted in a request to the Imperial County Emergency Medical Care Committee to change the long standing system design by allowing emergency ambulance transportation by one of the County's fire departments rather than the contracted provider. In addition, general issues of first responder viability has been raised at the EMCC. Fire agency based first responder services are a vital component of the EMS system and are necessary to ensure rapid response to medical emergencies in the rural areas of the County.

Project Description

The intent of this project is to implement necessary system-wide changes in a controlled manner in order to facilitate the coordination of emergency ambulance services and preserve fire agency based first responder services. In order to achieve this goal the EMS Agency has been working with the EMCC to clarify the various issues brought about by the requested changes in system design and to define the potential EMS system impacts. The EMS Agency has achieved agreement from the EMCC, through a recommendation to the Imperial County Board of Supervisors to create a task force to determine necessary system design changes and secure the necessary support of the system participants.

Tasks/Methodology

The Imperial County Board of Supervisors directed the EMS Agency to create System Design Task Force. The Task Force met monthly and gathered sufficient information to address the local issues and provide for planning activities. Creative solutions were proposed that were beyond the scope of the current system design. System participants were also solicited for input in an attempt at securing a cooperative and coordinated system design for approval by the Imperial County Board of Supervisors. Once the system design was completed, the service provider contracts could be modified to reflect the design principles.

Outcomes

The Task Force came to an impasse on reaching a consensus on a system design due to conflict/controversy over the Health & Safety Code "201" issue. This issue is to be readdressed after the courts decide the matter. The Task Force, in cooperation with the EMCC and the Imperial County Fire Chiefs Association, did agree on developing a county-wide quality improvement program, an Expanded Scope EMT-l trial study program, an Emergency Medical Dispatch (EMD) Program, an EMS Agency Fee Schedule, and

an EMS System Plan. All of these programs were developed during the project period and implemented the following fiscal year.

Conclusion

The controversy over the "201" clause may not be resolved for some time. Even after the courts decide the issue, it may end up in legislation. A consensus on local system design probably will not be reached until the absolute final ruling is made. Development and implementation of an Expanded Scope EMT-l program, an Emergency Medical Dispatch program, a system-wide quality improvement program, and an EMS System Plan will improve the quality and delivery of EMS throughout Imperial County. Implementation of an EMS Agency fee schedule will provide a stable funding source and assure the continuation of the local EMS agency.

EMS vs. Civilian Transport

Grantee:
Los Angeles County EMS Agency
Project Number: EMS-4050
Project Period: 06/25/95-06/30/97
Project Amount: $31,000.00

EMS Administrator:
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Prospective evaluation of injury-to-hospital time interval among EMS vs. non-EMS transported patients: Application of an interview tool

Introduction and Objectives

A previously published report found that non-critically injured patients transported to a Level I trauma center by civilian means (non-EMS) had a lower mortality when compared to their EMS-transported counterparts (EMS). Our objective was to determine time of injury among victims of major trauma in order to derive and compare the injury-to-hospital-arrival time for EMS- and non-EMS-transported patients.

Methods

A newly developed interview tool (for patients, witnesses, friends, family members) was prospectively used and combined with information from paramedic, medical examiner, police and sheriff records to determine the exact time of injury of major trauma patients admitted to a Level I urban trauma center. Inclusion criteria: Age 14-55, direct admission from scene. Exclusion criteria: Inability to choose mode of transport (transported by police or directly from prison). All major trauma admissions between January and May 1997 were screened. Time intervals were calculated and compared for patients in three groups: non-EMS, EMS-transported patients matched with a non-EMS cohort by age, mechanism of injury, Injury Severity Score, Head AIS and presence or absence of hypotension on admission (EMS matched), and every tenth EMS patient (EMS random).

Outcomes

Forty-four patients were entered; data were completed for 32 patients.

	Non-EMS	EMS matched	EMS random	p (<.05 significant)
N	9	9	14	-
Penetrating injury	9 (100%)	9 (100%)	9 (64.2%)	-
Mean age (yrs.)	17.2	19.6	33.3	.0001, .0003
Mean ISS	22	19	26	NS
Time interval (min.)	17.8	30.1	28.5	0.0396

Conclusion

In an urban setting, non-EMS transported patients arrived at the hospital more quickly than their EMS-transported counterparts; larger studies will be necessary to determine if this accounts for previously-described outcome differences.

Pediatric Airway Management

Grantee:
Los Angeles County EMS Agency
Project Number: EMS-4051
Project Period: 06/25/95-06/30/97
Project Amount: $123,000.00

EMS Administrator:
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(213) 890-7500

Introduction

The four-year Pediatric Airway Management Project was the largest study of its kind ever completed. The objective of the project was to study the effect on patient outcome of the addition of pediatric endotracheal intubation (ETI) to the paramedic scope of practice and to compare outcomes of patients treated with bag-valve-mask ventilation (BVM) and ETI in the out-of hospital setting.

Project Design

This was a prospective, randomized (calendar day) trial in two urban emergency medical services system, Los Angeles and Orange Counties. The project began by development of a unique educational program and audiovisual aids and then training nearly 2,700 paramedics in the skill of ETI and reviewed all aspects of pediatric airway control including BVM. The study began once the first paramedics completed the pediatric airway management education. During the study phase, pediatric airway management skills were randomized to even or odd days: BVM followed by ETI on even days and BVM only on odd days.

Tasks/Methodology

Investigators were paged for enrollment of each patient. Investigators and paramedics prospectively recorded out-of-hospital data on a standardized form. EMS Report forms, hospital records and coroner's records were reviewed for data. Data describing patient demographics, out-of hospital care times, out-of hospital and final diagnosis, airway procedure(s) performed and associated complications, mechanism of injury, ED and inpatient dispositions, hospital survival, and neurologic outcome were collected.

Outcome

Of 830 patients, 393 (47%) were randomized to receive BVM and 437 (53%) ETI. Fifteen out of 178 (8.4%) ETI patients were esophageally intubated or had unrecognized dislodgement, and died. Patient survival and neurologic outcome were not affected by type of airway procedure used. For ETI, scene times are longer and mortal complications are high. ETI does not increase survival and BVM has fewer serious complications. As a result, BVM is the preferred method for pediatric airway management.

Conclusion

The Pediatric Airway Management Study is of highest quality and will have far-reaching impacts. It was designed by non-biased investigators, had an excellent randomized study design, and contained

statistically appropriate patient numbers. More than 800 patients were randomized to either ETI or BVM ventilation. Children receiving BVM had outcomes just as good or better than those managed by ETI. In fact, there was a trend toward better outcome for children receiving BVM ventilation. In looking at a number of different patient subgroups, such as near drowning, no subgroup proved ETI was superior to BVM. The investigators believe these results are similar to previous, less-well performed studies, and that our overall rates of survival in respiratory and cardiac arrest are as good or better than reported by other EMS systems.

The Pediatric Airway Management Study has been a landmark undertaking in the history of EMS in Los Angeles and Orange Counties. While the focus was on potential differences between ETI and BVM ventilation, an array of other information has been discovered, including continuing education issues, data regarding drug dosage, value of Magill forceps in foreign body removal and other clinical issues. In addition, the educational component of the study substantially improved the overall level of care and management of pediatric patients in Los Angeles County.

Further details of the study will be available after journal publication.

Emergency Medical Dispatch (EMD)

Grantee:
North Coast EMS Agency
Project Number: EMS-4061
Project Period: 06/25/95-06/30/97
Project Amount: $40,000.00

EMS Administrator:
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(707) 445-2081

Introduction

The North Coast EMS region includes Del Norte, Humboldt, Lake, and a portion of southern Trinity Counties. These primarily rural counties have a population of about 215,000 living in area of 6,000 square miles. 911 calls are currently answered at one of eight primary Public Safety Answering Points (PSAP's). Depending on the location of the incident, these calls may be dispatched directly and/or transferred to one of two secondary PSAP's, a private ambulance dispatcher, or a volunteer ambulance service dispatcher. At beginning of the project none of these various agencies provided anything close to consistent or structured Emergency Medical Dispatch (EMD) service.

Project Description

In February of 1994 North Coast EMS applied for a Prevention 2000 Special Project Block Grant from the State of California, Emergency Medical Services Authority, to develop an Emergency Medical Dispatch EMD) program in its region. The first year grant was followed up in March of 1995 with the application and approval of a second year continuation grant. A one year extension was granted in May, 1996.

Objectives

The intent of the second year of the project was to complete the development and implementation of EMD in Humboldt County, and to expand the program to the rest of our region (Del Norte, Lake, and Southern Trinity Counties). The status of Emergency Medical Dispatch programs within the region were to be assessed. The Emergency Medical Dispatch program was to be expanded throughout the region. A system for evaluating the effectiveness of the program was to be developed and the program was to be generally expanded and improved for our entire region.

Tasks/Methodology

Early in the project it was identified that one of the principal challenges in implementing EMD would be in gaining the cooperation and support of the administrations of the various dispatch centers in the region. Our implementation strategy therefore focused on education and facilitation. First we needed to convince the agencies that they should be interested in an EMD program. Then we wanted to make it as easy as possible for them to develop their program. Feedback from the dispatch community was continually sought through task force meetings, distribution of draft policies and documents, and informational mailings.

Outcomes

During the term of this project significant progress has been made towards implementing EMD programs throughout our region. Five classes were conducted in four separate locations and attended by eighty-two dispatchers from public and private agencies throughout our region. EMD service is currently being provided, at some level, by three Humboldt County agencies. Additionally, one Humboldt County, one Lake County, and a Trinity County agency have been provided with EMD materials and equipment and are in the process of developing their programs.

Conclusion

During the two year term of the grant significant progress has been made towards the development of EMD in the North Coast EMS region. Full region wide implementation, however, was not achieved. The principal problem encountered throughout the term of the project was the lack of any enforcement or incentive authority to encourage or compel local dispatch agency administrators to adopt EMD. Many dispatch agency administrations were initially resistive or unwilling to spend time and money on training and implementation of EMD. We commend those who have committed to this program, but suggest some kind of regulatory or legislated incentive to encourage all dispatch agencies to adopt EMD in the future.

Rural/Urban Trauma Study

Grantee:
North Coast EMS Agency
Project Number: EMS-4062
Project Period: 06/25/95-04/01/97
Project Amount: $28,000.00

EMS Administrator:
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Introduction

Injury continues to be a leading cause of death and disability in the United States. Although trauma death and injury rates are generally higher in rural areas, the historical focus of trauma system development has centered on designation of urban based trauma centers and few patient outcome studies have been conducted in the rural setting. North Coast EMS, which covers a three-county area with a population of 215,000 in the rural/remote northwestern corner of California, identified high preventable injury death rates in the mid-1980's. Between 1988 and 1991, a California EMS Authority special project funded development of a rural trauma model which demonstrated statistically significant major trauma patient survival relative to the national Major Trauma Patient Outcome (MTOS) expected norms (J Trauma 1994; 36: 395-400). This model included a prehospital major trauma patient prewarning system, transport to the closest hospital, use of emergency department trauma teams and expeditious movement of injured patients to definitive care. In 1992, an attempt to compare trauma patient outcome between North Coast EMS and Harbor-UCLA Medical Center failed due to incompatible databases. A multivariate logistic regression extension of the TRISS method was developed, however, to compare trauma system type. Special project funding was requested to provide a uniform data collection process.

Project Description

Between December, 1995 and April, 1997, North Coast EMS, in partnership with Los Angeles County EMS and Harbor-UCLA Research and Education Institute (REI), received California EMS Authority Prevention 2000 Block Grant support for a rural/urban major trauma patient outcome study. Two consecutive special project contracts funded a single research project designed to contribute to our understanding of trauma patient care and trauma system effectiveness in rural and urban settings. The TRISS method and the new logistic regression coefficient were utilized to determine the effect of trauma system type on patient survival in the two study populations, rural and urban. The new extension is described as follows: After controlling for known TRISS regression coefficients (i.e., age, mechanism of injury, vital signs and Injury Severity Score), the effect of additional factors, such as type of trauma system, can be measured. This *unknown* coefficient allows determination of the relative efficacy of the two types of trauma systems. If the new coefficient is found to be statistically significantly different from zero, this would imply that the type of trauma system influences the probability of survival, after accounting for all other patient characteristics known to influence outcome. If the new logistic regression coefficient is found not to be statistically significant from zero, this would imply that the type of trauma system

has little or no effect on the probability of survival.

Tasks/Methodology

North Coast EMS and REI trained data collection specialists at both sites to uniformly retrieve data at the ten study hospitals, county corners offices and each of the approximately thirty transfer receiving hospitals. Data was collected on all trauma patients with an Injury Severity Score (ISS) score of 10 or greater who arrived at the eight community hospitals and the two Level I Trauma Centers between September 1, 1995 and August 31, 1996. The null hypothesis was established as follows: "In a population of moderately and severely injured trauma patients from a rural and urban trauma system; the type of system (rural vs. urban) in which patients are treated does not effect their survival, after adjusting for their underlying risk of death using TRISS methodology." All data obtained from this project was collected on laptop computers utilizing the same relational database program (Paradox 4.5, Borland Inc.) and statistical analysis was performed using the PROC LOGISTIC function of the SAS statistical analysis system (on a Digital Equipment Corporation VAX Minicomputer). Statistical tests included Chi square, Wilcoxon rank sum and multivariate logistic regression extension of the TRISS method.

Outcomes

A total of 1,123 trauma patients were entered into the study. 337 (30%) of the trauma patients were enrolled at the eight rural hospitals and 786 (70%) were enrolled in the two trauma centers. A combined total of 345 (31%) patients underwent surgery within six hours of presentation and a total of 157 (14%) died. The subjects at the urban trauma centers were younger (median age 31 urban vs. 41 rural, $P<0.0001$), more ethnically diverse (Caucasian 38% urban and 86% rural, $P<0.0001$), and had a higher proportion of males than females (75% urban and 62% rural, $P<0.001$). The urban population was also more seriously injured with a higher median Injury Severity Score (17 urban and 14 rural, ($P<0.0001$), a lower Glasgow Coma Scale ($P<0.0001$), a lower systolic blood pressure ($P<0.0001$), and a lower Revised Trauma Score ($P<0.0001$). More patients in the urban trauma centers suffered penetrating injuries (25% urban vs. 9% rural, $P<0.0001$). After correcting for differences in patient population, there was no increase in mortality associated with being treated in a rural hospital (Odds Ratio 0.77; 95% confidence interval 0.419 to 1.16). Survival in the eight rural hospitals in the North Coast EMS region was not statistically different than the two urban trauma centers in Los Angeles as compared to Major Trauma Patient Outcome norms.

Conclusion

Populations of trauma patients treated in urban and rural areas are fundamentally different. The urban patients are younger, more ethnically diverse, have greater injury severity and a higher proportion of penetrating injuries. Results suggest that trauma care systems, such as the rural system in this study, with low volume and high blunt trauma rates, can effectively care for its population of trauma patients with an enhanced, committed trauma system which allows for expeditious movement of patients toward definitive care, without hospital bypass of major trauma patients to designated trauma centers. Study results also verify that high volume, high penetrating trauma populations can be effectively managed by trauma centers.

Disaster Medical Assistance Teams (DMAT)

Grantee:
San Bernardino County EMS Agency
Project Number: EMS-5018
Project Period: 09/01/95-06/30/97
Project Amount: $30,000.00

EMS Administrator:
Diane Fisher
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San Bernardino, CA 92415
(909) 888-7511

Introduction

Patient management after a catastrophic disaster depends upon several preplanned facts. Disaster Medical Assistance Teams (DMATs) are trained for occasions where there is a collapse of the hospital emergency department ability to render aid or where there is no hospital and one is needed. The function of the project and its adjunct funding is to provide real time exercises for the California DMATs. These exercises allow the DMATs to be prepared to meet their 12 hour deployment and 72 hour sustained treatment criteria.

Project Description

The objectives for the project are:

1. The project is designed to develop and maintain proficiency and skills of DMAT team members in CA-1 through CA-9. Educational programs are planned to address proficiency and skills development.

2. To provide training required to maintain Readiness Level I teams in San Bernardino and San Diego counties. A training program agenda includes Readiness Level 1 topics.

3. To plan and conduct joint exercises with military, federal, state and local agencies to test the effectiveness of disaster response in southern California at all levels emphasizing:
   a. actual field medical response,
   b. response within agencies,
   c. interactions among agencies, and,
   d. resource requisition and utilization.

A training exercise known as Rough and Ready - 96" was conducted during December, 1996.

Tasks/Methodology

The above tasks were addressed by networking the needs and interests of each proposed exercise participant. Those areas of interest and need which overlapped were written into a scenario which the 800 exercise participants followed. It was of primary importance when drafting the exercise that each group be able to achieve a higher readiness level than that which they currently enjoyed.

Outcomes

This is the second major multi-level inter-agency exercise. After this exercise it is anticipated that teams will be able to raise their readiness level. Because of the way in which the exercise was planned, by listing overlapping areas of interest, each of the participants was able to increase its awareness

of other agencies and departments. The project continues a tradition of developing civilian and governmental agency cooperation in response to disasters.

Conclusions:

Development of a volunteer civilian medical reaction team involves several types of training. Training needs must be identified. This project is essential in that it brings professionals together who can instruct DMATs and provide guidance in developing their individuals into meeting the needs of the team.

California Pediatric Education for Paramedics (PEP)

Grantee:
San Francisco County EMS Agency
Project Number: EMS-4067
Project Period: 06/25/95-06/25/97
Project Amount: $77,000.00

EMS Administrator:
Abbie Yant
1540 Market Street, Ste. 220
San Francisco, CA 94102
(415) 554-9963

Introduction

Pediatric education of prehospital providers has long been an area of deficiency in EMS. The Federal EMSC Program has devoted millions of dollars to development of pediatric instructional programs; but until the PEP Project, no single pediatric prehospital course has addressed the entire scope of cognitive, psychomotor and affective objectives appropriate for a comprehensive training program in acute childhood illness and injury. The California PEP Project began with a broad, multi-specialty advisory and authorship group to ensure an integrated and state-of-the art product. The extended developmental phase of the project drew upon the excellent previous work of many federally-sponsored EMSC educational efforts, and upon the scientific foundations for pediatric emergency care laid out in the prominent national pediatric life support courses ! PALS and APLS. The final product of the project was an entirely new and original educational program, highly assessment-based, and specifically earmarked for paramedics trainees as their first training experience in acute injury and illness care of children. To teach the extensive cognitive and psychomotor learning objectives, and to establish the desired attitudinal and emotional (affective) approach to children, the PEP Course adopted a user-friendly, interactive process. The course employs a totally case-directed format, that brings together multiple teaching strategies, including significant hands-on small group discussion and skills stations. After multiple pilotings, and course revisions, the final PEP Course became a two day 15 hour exercise.

Project Description

The project was a highly collaborative national consensus effort among pediatric prehospital experts. The advisory and authorship group closely linked professional organizations in medicine, nursing and EMS to the project staff. The PEP Project arose from and remained part of the California EMSC Project, a federally funded effort with the California EMS Authority that developed a paradigm for EMSC within EMS in California. The California PEP Steering Committee reviewed all prior work in prehospital pediatric education, then molded the knowledge base into a single set of educational objectives for the PEP Course. The objectives were then specifically outlined and translated into an innovative program involving complementary lectures, skills stations and videotapes of live and simulated pediatric emergency situations.

After initial course development, the PEP Course underwent extensive piloting of both the provider and instructor courses lasting two years from 1995 to 1997. During the two year interval, the PEP *Student Manual* was revised numerous times to reflect the extensive input from students, instructors and educators. A PEP *Slideset* and PEP *Videotape*

were produced to provide high quality visual educational adjuncts. A PEP *Instructor Manual* was developed to describe the desired process of teaching the course consistently.

Tasks/Methodology

The development, revision and final production of the PEP Course materials was centered in the office of Dr. Ron Dieckmann in San Francisco, in collaboration with the San Francisco EMS Agency. The California PEP Project was enlarged into a national project in collaboration with the Florida Emergency Medicine Foundation, the National Association of EMS Physicians and National Association of EMT's.

Outcomes

The outcomes of the project included four separate components:

1. The course materials. This includes the PEP *Student Manual*, the PEP *Instructor Manual*, the PEP *Slideset* and the PEP *Videotape*. The PEP *Student Manual* reflects the body of knowledge deemed appropriate for paramedic trainees. The PEP *Instructor Manual* outlines the process of teaching the PEP Course.

These products can be used for paramedic trainee education, or modularized and used for CE for practicing paramedics. In sum, the PEP materials provide a comprehensive foundation of current science and technology in pediatric emergency medicine suitable for the prehospital provider. The National Consensus Committee on Pediatric Prehospital Education declared in its Summary Report in 1997 that the PEP Course was a premier course in pediatric prehospital care in the United States and that no further alternative project should be supported at the present time.

2. The instruction of 161 paramedic trainees and practicing paramedics in the PEP Course, during eight PEP provider courses.
3. The instruction of 27 PEP Instructors from 14 counties in the state of California, primarily through two PEP instructor courses.
4. The dissemination of pediatric equipment BLS and ALS lists, and pediatric field treatment protocols throughout the state. Several local EMS agencies, including the San Francisco EMS Agency, have updated their protocols based upon the PEP standards.

Conclusion

The PEP Project has created a new educational standard for pediatric instruction for prehospital providers. The PEP *Student Manual*, the PEP *Instructor Manual*, the PEP *Slideset* and the PEP *Videotape* provide a complete set of innovative materials for case-based, assessment-oriented, interactive learning. The course provides a comprehensive foundation of knowledge and skills for EMSC education within overall EMS systems in California and throughout the country. The consensus process behind the development of the PEP Course has created a model of collaboration and information analysis, advocacy and evaluation. The PEP Course now requires active support from the EMS community to assure appropriate dissemination throughout California, to both trainees and practicing paramedics. The PEP Project should become an essential part of the forthcoming EMSC educational plan for prehospital providers in California.

Regional Disaster Medical Health Coordinator (RDMHC)

Grantee:
San Joaquin County EMS Agency
Project Number: EMS-4068
Project Period: 06/25/95-06/30/96
Project Amount: $30,000.00

EMS Administrator:
Darrell J. Cramphorn
P.O. Box 1020
Stockton, CA 95201
(209) 468-6818

Introduction

This Project actually began four years when San Joaquin Agency applied, on behalf of the other counties in Region IV, for a medical mutual aid grant to improve MCI response. The basic assumption was that the counties in the Region could do a better job of providing multi-casualty response if it would standardize its policies, procedures, terminology, forms and communication channels among the neighboring counties. At the time of the initial grant application, all the counties in Region IV had their own, separate MCI and Disaster Response Plans. When border MCIs occurred, there would be two systems of management, which lead to delayed response, confused care on scene and problems with patient destination and care.

After four years of development funding from the California EMS Authority, sufficient progress had been made in adopting a standard Medical/Health Mutual Aid Plan within the Region. To maintain the progress, the Region qualified for continued maintenance funding through the State. This is the first year of the maintenance funding.

Project Description

This year, the main goal of the Project was to establish a structure to maintain the progress made in the prior four years and to establish a consistent organizational structure that would allow Region IV counties to continue their cooperative venture. Consequently, the main objectives related to conducting drills to test readiness, refining the Medical/Health Mutual Aid Plan, and to ensure that the Administrative Committee originally established four years before would continue to meet. Training at the field and hospital levels continued as well.

The Project also included objectives for the grant staff to participate in State Committees to adopt guidelines for disaster response and for other areas to standardize, where possible, the forms and/or agreements used. Grant staff have been very willing to do this.

Tasks/Methodology

The Grant accomplished several major tasks during this period. First, it solidified the Administrative Committee. The meeting schedule and committee composition were established. The Administrative Committee also reviewed and revised the Medical/Health Mutual Plan in accordance with SEMS and other requirements. In addition to the Administrative Committee, we gathered the Operational Area Medical Health Coordinators together to review job descriptions and duties. The staff also conducted several drills, testing both the communications system and the Medical/Health Plan. Another task accomplished that was not listed in the Grant

objectives was hospital training for the disaster control facilities (DCFs). All these activities support the implementation and standardization of MCIs and disasters.

The work was accomplished with a core grant staff of four individuals who have other duties on a full time basis. The administrative committee provided a forum to determine what changes need to be made. The Plan is reinforced through training, drills and meetings and/or critiques.

Outcomes

The Project has a revised Medical/Health Mutual Aid Plan. A copy has been distributed to the State. The Plan is the key document guiding the practices during disasters for Region IV. In addition, the Project has produced policies for the duties of the Regional Disaster Medical Health Coordinator and the Operational Area Medical Health Coordinator roles. The Plan and the job duties for RDMHC and OAMDHC are available for use by others.

Conclusion

The Project has significantly changed the way counties in Region IV handle MCIs and disasters. We utilize common terminology and common approaches. In addition, the Project over the years has enhanced the communication between counties. We know more people, so when requests for assistance are done, it is done so with a familiarity that enhances our ability to work together. Overall, we have been happy with the progress made in this area and feel it can be duplicated in other forums. The commitment to a common goal is substantial.

Emergency Medical Dispatch (EMD)

Grantee:
San Luis Obispo County EMS Agency
Project Number: EMS-5016
Project Period: 09/01/95-03/31/97
Project Amount: $65,000.00

EMS Administrator:
Tom Lynch
712 Fiero Lane, #29
San Luis Obispo, CA 93401
(805) 546-8728

Introduction

The San Luis Obispo (SLO) County Emergency Medical Services Agency (EMSA) determined in 1995 that Emergency Medical Dispatch (EMD) was an integral part of any Emergency Medical Services (EMS) System. Because the SLO County EMS did not utilize EMD, a grant proposal was submitted to secure funds for this project. At the beginning of the grant period no Dispatch Center in SLO utilized EMD.

Project Description

The goal of the project was to implement EMD in at least one dispatch center in SLO County. The objectives included researching and selecting an EMD program from a vendor, providing training, and implementing the EMD project.

Tasks/Methodology

After obtaining the appropriate human resources to complete the project, numerous objectives were identified to assist in accomplishing our goal of implementing EMD in at least one dispatch center. Local EMS Agencies in California were contacted to determine what EMD system they used. The available literature on EMD including, Department of Transportation (DOT) Guidelines, California EMS Authority Guidelines, and numerous professional journal articles were reviewed. Vendors of the various EMD programs were contacted and their programs reviewed for compliance with local needs and State and Federal guidelines.

At the conclusion of our research we determined that EMD would work in SLO County and that we would utilize the Association of Public Safety Communications Officials, Inc. (APCO) EMD Program. APCO was selected over the other available programs because of the ability to customize the guidecards. APCO also allows for local instructors to teach the EMD course.

An instructor was trained and local courses scheduled. The APCO guidecards were customized with input from the EMSA Medical Director, EMSA Operations Committee, and the EMSA Clinical Advisory Committee. A total of seventy-four local dispatchers were trained to the EMD level and fourteen local dispatch center Mangers were trained to the EMD Manager level.

Outcome

SLO County has eight (8) Primary Public Safety Answering Points (PSAP) and 1 secondary PSAP. Seven of the primary PSAP's are under local Police Chief control and one is under the control of the County Sheriff. The lone secondary PSAP in SLO County is under the control of the County Fire Chief. At this point EMD has been

implemented in only the ambulance dispatch center operated by the County Sheriff. The remaining PSAP's have dispatchers trained and the necessary equipment to implement EMD. They have chosen to research the program further prior to implementation.

Conclusion

Although the official grant period has long since ended, this project continues on in SLO County. EMSA staff continue to work closely with local Police Chiefs in an attempt to implement EMD in all County PSAP's.

Trauma System Evaluation

Grantee:
Santa Barbara County EMS Agency
Project Number: EMS-4069
Project Period: 06/25/95-12/31/96
Project Amount: $36,000.00

Interim EMS Administrator:
Nancy LaPolla
300 North San Antonio Road
Santa Barbara, CA 93110
(805) 681-5274

Introduction

Recognition of trauma care as a significant public health issue was formally documented in 1966 with the publication of a report by the National Research Council and the National Academy of Science entitled, "Accidental Death and Disability: The Neglected Disease of Modern Society." As a result a process of research was launched. The development of trauma systems in the country resulted in significant improvements in trauma care by the 1980's. Trauma is now defined as a discreet clinical entity calling for special expertise, clinical experience, committed hospital resources, and rehabilitation procedures.

The trauma care system for Santa Barbara County was developed in 1988. At that time it was determined to establish an inclusive type system, which provides for a basic level of trauma care capability at all of the seven base hospitals. This system is fully integrated into the EMS system and serves to meet the needs of all injured patients requiring care in acute care facilities, regardless of severity of injury.

It has been demonstrated in Emergency Medical Services (EMS) systems throughout the nation that an organized, systematic approach to trauma care results in a reduction in mortality and morbidity. Santa Barbara County EMS system, presently does not have a trauma registry, therefore the system lacks the ability to identify the rate of preventable death. However, the literature has clearly demonstrated that an organized system of care for injured persons and organized prevention efforts reduce mortality and morbidity.

The most apparent deficiency in the current system is the lack of a coordinated, documentable system approach to care for acutely injured patients. There is no method to track patients from the pre-hospital phase through the rehabilitation phase and or referral out of County to a specialty center care. To address this deficit, the EMS Agency applied for and received funding from the State EMS Authority to conduct a trauma system evaluation study, and to develop a formal trauma system plan.

Project Description

The intent of this project was to build on the current EMS structure and formalize Santa Barbara County's trauma care system. The system is based on an inclusive model, encouraging all hospitals to participate at some level, dependent upon their resources and ability to care for specific levels of injury. The plan recognizes the importance of all facilities to provide trauma care to not only the severely injured victim, but to all other injured patients as well. "The model developed and put forth in the 1990 Trauma Care System and

Development Act encouraged the formation of an inclusive trauma system in which each care provider is incorporated into the system." (Resources for Optimal Care of the Injured Patient: 1993. American College of Surgeons, Committee on Trauma)

Task/Methodology

The primary objective of this project was to evaluate Santa Barbara County's current trauma system and to develop a formal written Trauma System Plan. In order to meet the broader goals of this project, several objectives were identified:

- To formulate a Trauma System Grant Project Advisory Committee, composed of all system participants including hospitals, the surgical community, pre-hospital providers, and the community-at-large.
- To review trauma systems and develop a County trauma plan. Available services both in and out of county were reviewed and catalogued in our Strategic Plan. Trauma Plans were obtained from other Local EMS Agencies and reviewed and two site visits were conducted.
- To conduct a review of air transportation services. A Helicopter Work Group was established to conduct a review of air transportation issues. An Air Medical Transportation Policy was developed and approved.
- To compare trauma care to existing standards. Two independent retrospective studies were conducted to evaluate our current trauma system using TRISS analysis methodology. The results were very useful in determining the resources needed in developing our trauma system plan.
- To integrate the trauma plan into the County's Disaster Response Plan. Staff has been attending Disaster Planning Committee meetings and participating in disaster drills. The County's Multi-Casualty-Incident Plan has been incorporated into the Trauma System Plan.
- To evaluate trauma issues specific to Santa Ynez Valley. Reports were generated and analyzed specifically for Santa Ynez Valley and issues were addressed in the Trauma System Plan.
- To establish a Trauma Review Committee. The Trauma System Planning Grant Advisory Committee will act in this capacity as we move into the implementation phase of the project.

Outcomes/Conclusions

The EMS Trauma System Evaluation Project resulted in a comprehensive evaluation of our current system, measuring possible preventable deaths and comparing our system with existing national standards. A Trauma System Plan has been developed which identifies the overall system priorities, provides direction and establishes implementation time frames.

Emergency Medical Services for Children (EMSC)

Grantee:
Santa Clara County EMS Agency
Project Number: EMS-4070
Project Period: 06/25/95-12/31/96
Project Amount: $90,000.00

Interim EMS Administrator:
Robert W. Heilig
645 South Bascom, Room 139
San Jose, CA 95128
(408) 885-4250

Introduction

In 1994, the Emergency Medical Services (EMS) Agency began the process of developing a comprehensive plan for Emergency Medical Services for Children (EMSC) in Santa Clara County. The Emergency Medical Services for Children Taskforce was developed as an advisory body to the EMS Agency. The Taskforce is a multi-disciplinary group comprised of committed individuals representing the medical community.

Project Description

The Task force was directed to:

- Provide advice and assistance to Santa Clara County EMS Agency and the Department of Health on the preparation and submission of a special project grant to the State of California, Emergency Medical Services Authority for the purpose of development and implementation of a comprehensive EMSC system for the County.
- Assist the County with assessing resources and services for children and identify problems in providing care for injured and critically ill children.
- Advise and assist the Agency on the development of appropriate policies, criteria, and guidelines for each component of the EMSC system.
- Advise and assist the Agency on implementation strategies for each component of the EMSC system.

In 1995, the Agency was awarded an EMSC planning grant and hired Ann Pettigrew, M.D., from the Pediatric Intensive Care Network of Northern and Central California to provide consultation to the project. The grant also allowed the Agency to hire a full-time nurse coordinator for the project.

Tasks/Methodology

The Taskforce utilized multiple subcommittees working in a consensus fashion to develop specific work products. The work products included the development of:

- Equipment lists for prehospital providers
- Twenty-seven (27) Pediatric Prehospital Treatment Protocols
- Guidelines for Basic Emergency Departments
- Child Injury Prevention Conference January 1997

Outcomes

Work products as described above; on-going EMSC Task force with a defined multi-disciplinary structure and specific goals; all ED's working to achieve compliance with ED

guidelines; ongoing commitment of the EMS Agency and County Public Health Department to continue a special focus on pediatric emergency medical care issues.

All areas of this on-going project are progressing in a positive way. Avenues of communication have been developed. Coalitions, affiliations and networks are resulting from the shared goals of all participants.

Prehospital Care Data System

Grantee:
Santa Clara County EMS Agency
Project Number: EMS-4071
Project Period: 06/25/95-06/30/97
Project Amount: $65,000.00

Interim EMS Administrator:
Robert Heilig
645 South Bascom, Room 139
San Jose, CA 95128
(408) 885-4250

Introduction

Currently, pre-hospital data collection, quality assurance/quality improvement, provider contract compliance, trauma system review, and certification/accreditation data management are carried out as separate activities in our agency, creating a labor intensive and noncohesive means for data retrieval and system-wide monitoring. While a significant amount of information is available, there is no system in place to adequately manage, compile, and generate useful reports using that data.

Project Description

In order to reduce or eliminate the impact of the problems described previously, the EMS Agency proposed an integrated Prehospital Care Data System (PHCDS). This program would provide all prehospital providers, hospitals, Public Health departments (e.g., Maternal and Child Health, Poison and Disease Control, etc.), and the EMS Agency, the ability to integrate a data system, with a CQI system via and EMS Management Information System (EMS-MIS).

This system would allow data collection flexibility, in that it can occur simultaneously with computerized PCR report generation, while maintaining the option of downloading data from various providers' systems, and integrating that data into the central system at EMS.

Tasks/Methodology

The grant proposal was developed by the EMS Agency's Information Systems staff, and overseen by the EMS Administrator. The primary project objectives were:

- *To create a customized Prehospital Care Report (PCR) and Data System that will conform to the needs of the SCC EMS Region and will reduce duplicative labor efforts by 50% within the first year of installation of the new data system.*

- *To reduce the maintenance of redundant EMS data systems by 50% within the first year of implementing the new data system.*

- *To link data collection QA/QI activities, the Trauma Registry, and Certification for Prehospital Care Personnel via one data system, thereby reducing data fragmentation by 50% within a year of operating the new system.*

A qualified programmer consultant was hired to create the specialized data system and assist the constituent groups' system development process. Project progress and outcome was continuously evaluated in

cooperation with the participating agencies.

Outcome

Although several goals were subsequently identified as not being achievable within the grant period, the project has made significant progress in realizing its primary objectives.

A data management system, customized to the needs of the local system has been developed, and is undergoing additional refinements. A 25% reduction in duplicative data entry should be realized by the end of 1997, with an additional 25% reduction by mid 1998.

Integration of the existing systems with the EMS Agency's data management system will virtually eliminate system redundancy by mid 1998, and integration through import/ export linkages has the added advantage of reducing overall cost.

Personnel certification/accreditation, communications, and limited QA/QI information has already been transferred to the new system. Trauma registry information will be added by late 1997, and electronic entry of first responder patient care records added by mid 1998. Data fragmentation has already been reduced, and the linkage with additional systems will provide at least 50% reduction in data fragmentation within one year.

Conclusion

The Prehospital Computerized Data Collection System grant has provided the EMS Agency with a stable platform to continue to build and enhance its data management capabilities, and to begin using the captured data in a manner that supports future local EMS system development and quality improvement objectives.

Emergency Medical Dispatch (EMD)

Grantee:
Santa Clara County EMS Agency
Project Number: EMS-4072
Project Period: 06/25/95-09/30/96
Project Amount: $65,000.00

EMS Administrator:
Robert Heilig (Acting)
645 S. Bascom Avenue
San Jose, CA 95128
(408) 885-4250

Introduction

With broad based support and encouragement from the local emergency services community, the Santa Clara County EMS Agency proposed to make substantial improvements to the Emergency Medical Dispatch program currently in operation in the county.

Project Description

The purpose of the project was to build on the existing Pre-Arrival Instruction (PAI) only Emergency Medical Dispatch (EMD) program now in limited use. The project, in two phases, will result in an organized, medically appropriate, interrogation of callers requesting medical service and dispatch of proper resources.

Tasks/Methodology

The proposal was developed by the EMS Agency using other proposals as a guide. Project objectives included formation of a Steering Committee, an implementation plan, dispatcher training, and raising public awareness.

Project progress and outcome was continuously evaluated by the Project Manager in cooperation with the participating agencies.

Outcomes

Through the combined efforts of the participating agencies, Pre-Arrival Instruction is now available on 82% of EMS calls. Prioritized dispatch continues to develop, and implementation is anticipated to begin within the next year.

Conclusion

Providing for the additional skills has significantly increased the availability of Pre-Arrival Instructions and has laid the foundation for prioritized dispatch.

SECTION II

SPECIAL PROJECT ABSTRACTS

1996/97 SFY GRANTS

Emergency Medical Services for Children (EMSC)

Grantee:
Alameda County EMS Agency
Project Number: EMS-6031
Project Period: 09/01/96-08/31/97
Project Amount: $60,000.00

EMS Administrator:
Michael Harris
1000 Broadway, Suite 5024
Oakland, CA 94607
(510) 628-5060

Introduction

With the 1995 publication of the California Emergency Medical Services for Children (EMSC) Final Report, Alameda County EMS District (EMSD) recognized the need to review its system's pediatric components and capabilities. A comprehensive review and analysis of the Alameda County system was then performed. The study provided the District with justification to proceed with the planning, development, and implementation of a comprehensive EMSC system that would integrate community pediatric emergency and critical care.

Project Description

The overall goal of the Alameda County EMSC Project was to design a comprehensive system that would address all aspects of pediatric emergency and critical care services. The completion of a pre-grant review and analysis of the system's pediatric components and capabilities provided the Project with key issues to target during the first year. The following six objectives were identified to initiate the process of EMSC system development:

Objective 1: To establish an organizational and administrative structure to coordinate the project.
Objective 2: To develop an approved EMSC Plan.
Objective 3: To review and revise pediatric pre-hospital field treatment protocols.
Objective 4: To develop pediatric guidelines for Alameda County receiving facilities.
Objective 5: To participate in the planning of the Alameda County EMS data collection system.
Objective 6: To monitor costs associated with the implementation of the EMSC system.

Tasks/Methodology

A multi-disciplinary EMSC Advisory Committee, established by the EMS District, served as the Project's work group. The California EMSC Project Final Report was utilized as the committee's primary resource for the review and revision of existing pediatric guidelines and the development of new documents. Two subcommittees were convened on an ad-hoc basis to initiate work on the development of an EMSC Plan and to review and revise all pediatric-related pre-hospital field treatment policies. Each subcommittee presented its final work and recommendations to the EMSC Advisory Committee for additional input and approval. Public comments were solicited on all documents produced by the Committee prior to final approval by the EMS Administrator and Medical Director.

Outcome

Guidelines for emergency departments were developed by the EMSC Advisory Committee. The final document, *Administration, Personnel and Policy Guidelines for the Care of Pediatric Patients in the Emergency Department* received final approval for county-wide implementation.

EMT-I and Paramedic field treatment protocols were reviewed and appropriately revised. To facilitate the continuity of appropriate pre-hospital care, pediatric-related Emergency Medical Dispatch protocols were included in this process.

The EMSC Plan Subcommittee determined that the development of quality EMSC Plan would require more time than originally proposed. A request for an extension to complete this objective during the second year of the Project was approved by the EMSC Advisory Committee.

Conclusion

The Alameda County EMSC Project completed a very successful first year. First and foremost, a network of pediatric emergency medical and critical care service providers was established. The EMSC Advisory Committee, utilizing the California EMSC model, worked expeditiously to produce documents detailing several key components of the evolving Alameda County EMSC system. It is the Project's intent to build upon these accomplishments to complete the overall Project objective of improving the quality of pediatric care in Alameda County through the incorporation of an EMSC system into the existing EMS system.

Statewide EMS Database System

Grantee: Alpine, Mother Lode (Mountain-Valley) EMS
Project Number: EMS-5025
Project Period: 06/30/96-06/30/97
Project Amount: $70,000.00

EMS Administrator:
Steve Andriese
1101 Standiford Ave., #D1
Modesto, CA 95350
(209) 529-5085

Introduction

This project was intended to provide strongly desired improvements in the EMS Database System software used by six local EMS agencies and many other EMS related organizations in Northern California to collect, manage and report on EMS call and patient data.

This project was designed to improve on the State EMS Authority's data aggregation efforts begun in FY 1995/96. The Authority needed to be able to independently collect statewide summary EMS data at its offices, and also needed the ability to automatically validate, group, and report on that data.

Project Description

This project accomplished the following objectives:

- Collection, maintenance, validation and reporting back to local EMS agencies of statewide aggregate summary data collected from those local agencies.
- Development of a Statewide Aggregate Database including data structures and utility software for the continued collection, maintenance, validation and reporting of aggregate summary data.
- The development of EMS Data Pro, a powerful new EMS data management system for Windows 95 and Windows NT.

Project Methodology

Development of Statewide Aggregate Database

The EMS Authority and Contractor worked together during FY 1995/96 to develop a set of seven basic quarterly reports requested from all of the local EMS Agencies in the state.

These reports were requested from the local agencies on a quarterly basis.

Data from reports received from local EMS agencies were entered into a database at the EMS Authority, and then validated using the utilities developed for this project. Errors were corrected whenever possible through communication with the submitting agency and/or through cross-checking the data submitted.

After validation, data were grouped according to data quality, and then reports were generated for each group. Reports were sent to the agencies participating in data submission.

As the work of managing, validating, and reporting state data continued throughout this project, utility software was developed

and improved as needed.

Development of EMS Data Pro

As the EMS Database System, Version 4.0, was used over the previous year by many organizations in Northern California, information was collected regarding bugs, as well as improvements users would like to see. This information, along with specific interviews with the local EMS agencies making the most use of the system, was used to compile a list of desired features for the new system. Available operating systems and development environments were also factored into this planning.

Once core and optional system features had been determined, programming began. Each programming phase was tested by programming staff, and each phase was again tested if modified during the course of the development of other phases. Modules were also tested by several users of the current system, all of whom had at least a year's exposure to the existing system, and who typically worked with different modules within the system.

Project Results

This project leaves behind a solid data structure and set of utilities for aggregating, validating, manipulating and reporting summary data from local EMS agencies. The system can be used for a wide variety of applications including:

- Developing statewide estimates of patient populations having various characteristics.
- Giving local EMS agencies information about how characteristics of their EMS systems compare to other like systems.
- Giving the EMS Authority much needed information about the volume and characteristics of EMS calls and patients in California

This project also produced EMS Data Pro, a markedly improved EMS data system for local EMS agencies, first responders, ambulance providers, and hospitals, that in upgrades alone will improve data management in at least eleven California counties. Some of the notable improvements in the new software are:

- Vastly improved technician name/address, certification, class/test data management.
- The addition of company data management to afford tracking of organization information and association between technicians and companies.
- Improved querying and reporting speed.
- Improved appearance of reports.
- The ability to print to any type of printer.
- Expanded patient data collection capability, including the addition of First Responder data fields and the ability to collect multiple sets of vitals.
- Improved user-defined data validation capability.
- Improved data import/export capability.
- EMS Data Pro is Windows-based.
- EMS Data Pro is written in an object-oriented development environment, so that the work of future modifications and revisions will be extremely efficient.

Operational Area Disaster Medical/Health Coordinator (OADMHC)

Grantee: Alpine, Mother Lode (Mountain-Valley) EMS
Project Number: EMS-6016
Project Period: 07/01/96-06/30/97
Project Amount: $34,000.00

EMS Administrator:
Steve Andriese
1101 Standiford Ave., #D1
Modesto, CA 95350
(209) 529-5085

Introduction

For several years, the Mountain-Valley EMS Agency has taken a lead in bringing together many of the local emergency response agencies through multi-disciplinary disaster exercises and formal Multiple Casualty Incident reviews in order to standardize our response to disasters. However, this agency lacked the funding to effectively coordinate with other Operational Area Coordinators to develop a Standardized Emergency Management System based upon current State guidelines.

The Agency has been delegated the function of the Operational Area Disaster Medical/Health Coordinator (OADMHC) for the counties of Alpine, Amador, Calaveras, Stanislaus and Tuolumne. In the event of a major medical emergency, the OADMHC is responsible to have a system in place to mobilize medical and health resources and coordinate the acquisition and movement of those resources with the OES Region IV Disaster Medical Health Coordinator (RDMHC). General responsibilities of the OADMHC have been outlined in a previously funded OES Region IV MCI Special Project, which describe the components necessary in a OADMHC plan. However, no local activation process or standard operating procedures for the OADMHC were in existence before this project.

Most of our local medical and health administrators began reviewing and revising their disaster plans in response to the SEMS legislation in 1995. Additionally, the other local operational area coordinators within the other emergency response disciplines have been responding to the new legislation by reviewing and updating their local response plans. However, little work had been done on most local levels to revise and exercise the interdisciplinary responses within the Operational Area Emergency Operations Center (EOC) and its relationship to the various Department Operations Centers (DOC). Moreover, in many disaster exercises, operational problems regarding the response to medical or health specific incidents had largely been left unaddressed. Again, the need for medical/health standard operating procedures was evident.

While reviewing materials developed in other mutual-aid branches of the county, it became evident that there had been lack of coordination and duplication of efforts in developing resource directories and facilities maps. Many of these resource tools were discovered to either be grossly outdated or inaccurate and could clearly be updated and consolidated into a more manageable document.

Project Description

<u>Development of a local OADMHC Activation Plan</u>

Local activation procedures were developed with the cooperation of the local OES, law and five operational area coordinators. As part of this development, the role and responsibilities of the local OADMHC activation point were developed. Specific roles and responsibilities of the EMS agency department operations center were identified, as well as the OADMHC role in the operational area EOC. Emphasis was placed on maintaining standardization with law and fire operations and the State's SEMS guidelines.

Establish a 24-hour Activation Point

An agreement was developed with a local 24-hour dispatch agency and then submitted to the EMS Agency Board of Directors for approval. Once the agreement was established, training was conducted for the 24-hour Activation Point personnel.

Development of Standardized Resource Maps

With the cooperation of other operational area coordinators, maps depicting the local Mobilization Areas, Rendezvous Points, & Staging Areas were created. The final product was distributed to all the OES coordinators in our member counties.

Establish Alternative Disaster Communications Links

A fixed auxiliary radio antenna was installed in order to facilitate the utilization of auxiliary radios as an alternate communications method between the OADMHC and the RDMHC or local providers. Also, a Med-net base station was procured and installed as an alternative method for EMS agency personnel to communicate with local hospitals and ambulance providers during a state of disaster or state of emergency.

Develop a Regional EMS Resource Directory

A medical & health resource directory was created as part of this project. As many of the resources are sought on a regional basis during times of disaster, a regional resource directory was developed with the aid of medical & health resource providers within our member counties.

Tasks/Methodology

OADMHC Standard Operating Procedures

This project allowed the Mountain-Valley EMS Agency staff to develop a Standard Operating Procedures manual for the OADMHC, specific to the medical/health mutual aid system. This manual addresses:

- **Activation of the OADMHC**: The EMS Agency developed an agreement with a local EMS dispatch center to act as the 24-hour OADMHC activation point. The dispatch center assigned an (800) access number in order to facilitate activation from within any of our member counties. Additionally, this dispatch center possessed the necessary hardware to send alpha-numeric pages to EMS Agency staff when notified.

- **24-hour Activation Point for the OADMHC**: The designated dispatch center developed an activation policy and procedure for relaying information and requests to the OADMHC. All dispatch personnel were then trained to these protocols.

- **Position Checklists for the Departmental Operations Center**: Substantial work was put into the development of the OADMHC (DOC Director) checklist. Through a series of meetings with local OES, Fire and Law Coordinators, several drafts of a job action sheet for the OADMHC were developed. Significant insight was also obtained through participating in the activation of the local Emergency Operations Center in response to the '97 Floods of northern California. The final OADMHC checklist was integrated into the activation process of a Departmental Operations Center. Additional checklists were created for the other major functions in a DOC, (i.e. Logistics, Planning, Finance).

- **Maps Depicting Hospitals, Mobilization Centers, and Rendezvous Points**: Local maps were obtained from county planning offices in order to produce and customize maps which would indicate hospitals, health departments, airports, mobilization centers, and rendezvous points for medical, fire, and law within each of our member counties. After the maps were obtained, they were scanned and uploaded to a desktop computer. Using Corel Draw software, new maps were created in full color, and distributed to the various emergency response agencies within our member counties. An attachment to each county map contains a list of the names and street addresses of the various facilities.

- **Medical/Health Resource Directory**: This portion of the manual contains lists of names and phone numbers for: EMS Agency staff, Health Departments, Hospitals, Ambulance Providers, EMS Dispatch Agencies, Veterinarians, OES Coordinators, and Auxiliary Radio Coordinators within each of our member counties.

- **Standardized Forms**: The following forms, specific to medical/health resource management, are included in the final section of the OADMHC manual: the RIMS *Resource Request* form, developed by State OES; the RIMS *Medical/Health Status Report* form; the MACS form 420, used for *Resource Tracking*; and the OASIS *Operational Area Resources* form.

Medical/Health Conference

In addition to the development of the manual, Mountain-Valley EMS Agency also sponsored a Medical/Health conference. This was the first time that all of the local medical and health provider agencies were brought together to address disaster response on a local, regional and state level. Several months of planning were involved to obtain facilities, produce overheads, slides, and the conference syllabus. Speakers were secured from the State EMS Authority, State Health Department, Regional Disaster Medical/Health Coordinator, Operational Area Disaster Medical/Health Coordinator and local Office of Emergency Services. In addition to reviewing the medical/health mutual aid system, participants were divided by agency type and guided through a table-top exercise which focused on developing an Incident Action Plan.

Alternative Communications

An auxiliary radio antenna was installed at the EMS Agency as an adjunct to

the current communications systems. Additionally, a UHF radio base station was installed as an alternative communications system. This will allow agency staff to communicate with local and regional hospitals, ambulance dispatch agencies and other medical/health providers in the event of a telephone system failure.

Outcomes

This project produced several vital tools for use by EMS Agency staff, as well as many other emergency response agencies throughout our six member counties. These products include:

OADMHC Standard Operating Procedures Manual

Mountain-Valley EMS Agency now has a Standard Operating Procedures manual for the Operational Area Disaster Medical/Health Coordinator (OADMHC), specific to the activation, response and coordination relative to the medical/health mutual aid system.

Maps Depicting Hospitals, Mobilization Centers, and Rendezvous Points

Maps indicating local hospitals, health departments, airports, mobilization centers and rendezvous points were created in full color and distributed to the various emergency response agencies within our member counties. An attachment to each county map contains a list of the names and street addresses of the various facilities.

Medical/Health Resource Directory

Included in the OADMHC manual is the Medical/Health Resources section, which contains lists of names and phone numbers for: EMS Agency staff, Health Departments, Hospitals, Ambulance Providers, EMS Dispatch Agencies, Veterinarians, OES Coordinators, and Auxiliary Radio Coordinators within each of our member counties.

Medical/Health Conference

Many positive comments and feedback were received regarding this 6-hour conference from conference participants. Requests for future meetings of this nature were also received from various medical and health provider agencies.

Alternative Communications

An auxiliary radio antenna was installed at the EMS Agency as an adjunct to the current communications systems. Additionally, a UHF radio base station was installed as an alternative communications system. This will allow agency staff to communicate with local hospitals and ambulance dispatch agencies in the event of a telephone system failure.

Conclusions

After utilizing the OADMHC activation process, position checklists, and resource manual during several mutual-aid drills, Mountain-Valley EMS Agency staff have found that the system developed through this project is effective for the management of medical/health resources. Ongoing training and drills are needed in order to maintain the skills and familiarity with the forms and processes for resource requests and resource tracking.

Methods for annually updating resource maps and information are yet to be developed.

EMS Quality Improvement

Grantee: Alpine, Mother Lode (Mountain-Valley) EMS
Project Number: EMS-6030
Project Period: 09/01/96-08/31/97
Project Amount: $33,920.00

EMS Administrator:
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Introduction

Many organized emergency medical services (EMS) systems currently struggle to evaluate performance. While data collection has improved in recent years, the need for a standardized "evaluation" process remains. This project was undertaken to develop a standardized process for local EMS participants to evaluate system variation and performance.

Project Description

This project was undertaken to establish a process which could evaluate EMS system performance by using existing local EMS system data to show statistical variation and published peer review studies to establish benchmark quality indicators.

Methods: The process involved four primary steps;

1. *Community Consensus*

A panel of local EMS experts were assembled to provide oversight and support. The panel developed specific questions regarding the system and produced a list of indicators. The list of indicators were further defined and decision rules for abstracting data were developed.

2. *Local System Variation Analysis*

Local system data was abstracted specific to each indicator and plotted over a twelve (12) month period. The median, mean and statistical control limits were calculated. Indicators were then tested for special or common causation.

3. *Benchmark Analysis*

Medical literature searches were performed for each indicator. Searches focused on abstracting benchmark performance data of similar systems from published peer review journals. Benchmark data was extracted in the original statistical format for comparison.

4. Structure and Process Development

An organized structure and process for collegial evaluation was defined. The process identified steps for system evaluation based upon analysis of variation and comparisons to benchmark indicators.

Outcomes

A total of thirty-eight (38) indicators were established during the study period. Thirty three (33) were process indicators and (5) five were outcome indicators. Each indicator was classified, defined, and analyzed for statistical variation. Special and common cause variation was identified. Benchmark

indicators were assigned for comparisons. Process steps were developed and recorded.

Conclusion

A process model for EMS system evaluation was developed, recorded and implemented using statistical control charts and benchmark quality indicators. This process must be integrated into a organized structure which promotes collegial review and action to improve the system.

Regional Disaster Medical Health Coordinator (RDMHC)

Grantee:
Contra Costa County EMS Agency
Project Number: EMS-5026
Project Period: 06/30/96-10/31/97
Project Amount: $90,000.00

EMS Administrator:
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Introduction

Region II, comprised of the 16 northern California coastal counties, is one of six regions established by the State Office of Emergency Services for the coordination of disaster mutual aid. The Contra Costa County Health Officer has served as the Region II Regional Disaster Medical/Health Coordinator (RDMHC) since 1990. The RDMHC is responsible for coordinating the acquisition of medical/health mutual aid within Region II, both in support of events not affecting his region and those occurring within his region.

Project Description

The focus of the seventh year RDMHC Project was sponsorship of a Bay Area Disaster Medical Assistance Team (DMAT), a volunteer team organized under the National Disaster Medical System (NDMS) through the U.S. Public Health Service. DMATs provide local patient staging/reception services, field level emergency medical treatment, and augment local medical capabilities during disasters. Both the State EMSA and the U.S. Public Health Service have placed high priority on the formation of a DMAT in the SF Bay area. Currently, the Bay Area is the highest disaster risk metropolitan area (nationally) without a DMAT.

Bringing the RMDHC mutual aid process in line with CA Standardized Emergency Management System (SEMS) regulations was another major focus of the project. Objectives included getting the Region II RDMHC Emergency Plan adopted, developing a standardized mutual aid agreement to be adopted by each of the 16 counties, facilitating appointment of their Operational Area Disaster Medical/Health Coordinators (OADMHCs) and assisting counties with their implementation of both SEMS training and Hospital Emergency Incident Command System training. Establishing and maintaining contact with OADMHCs and individuals from other key mutual aid agencies through quarterly meetings, communication drills and table top exercises were objectives which facilitated response to the real disaster during the floods/storms of 1997!

Tasks/Methodology

DMAT Team Development: A Region II Steering Committee was established; a five-county Planning Committee was formed; a Development Plan was adopted, a sponsor identified, equipment purchased, a Policy and Procedure Manual drafted, and a Commander recruited. Initial individual county-component-unit concept was deferred and efforts focused on member recruitment.

Plan/Mutual Aid Agreement Development: The Region II RDMHC Interim Emergency Plan was adopted, containing the 16-county and state agency 24-hr. contacts and numbers which are updated quarterly.

Discussion of a "model" mutual aid agreement and ambulance mutual aid policies, and a table top exercise on ambulance mutual aid were held in preparation for developing a mutual aid agreement document. Training and Exercises: Implementation of SEMS at county med/health agencies continued through assistance with med/health agency departmental disaster plans and departmental operations centers, exercises and monthly communication drills via fax both day and night.

Outcomes

The products of Plan implementation, mutual aid agreement development, SEMS training and exercises, HEICS trainings, quarterly meetings, communications drills, and the strengthening of communication lines and understanding due to the efforts to develop and establish a DMAT team have all contributed to counties' knowledge and understanding of each others' organizations and resources, thus facilitating the implementation of a medical/health mutual aid system.

Conclusion

The relationships established with each of the Operational Areas, the state and federal agencies and other disaster response agencies enhance the Region's ability to provide the State EMSA with closer contacts, a better trained and better coordinated network of medical/health professionals during disaster medical/health mutual aid response to not only outside-the-region but also within-the-region events.

Poison Control Alternatives

Grantee:
Contra Costa County EMS
Project Number: EMS-6032
Project Period: 09/01/96-08/31/97
Project Amount: $25,000.00

EMS Administrator:
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Introduction

This report presents the results of the final year of a three-year study for the Contra Costa County EMS Agency. The study involved examining the feasibility of instituting alternatives to traditional poison control centers for management of poison calls. A reduction in funding and a failure to find alternative funding left Contra Costa County residents without the services of the San Francisco Poison Control Center (SFPCC) from August 4th 1993 to November 1, 1994 (residents were blocked from calling the SFPCC). This study was designed as a result of the call-blockage, and was funded by a special grant from the California EMS Authority.

In Year One, the study entailed researching alternative poison control models nationwide, determining the impact of call-blockage on EMS, and designing a study for Contra Costa County. Year Two involved reviewing hospital ED logs to determine if there was a substantial change in ED visits as a result of the call-block and implementing the test portion of the study for managing poison control calls. The evaluation of the results from the ED log review and the call simulation were performed in Year Three. Given the complexity and dynamics of the study, there was overlap between Year Two and Three.

Project Description

The goal of the third year of the Contra Costa County Alternative Model Poison Control Center Study was two fold -- analyze the data gathered during the ED Log Review and analyze the data generated from the alternative model call simulation test.

The alternative poison model study required comparing two alternative test sites, an advice nurse program and a 9-1-1 public safety answering point (PSAP), to a traditional poison control center. The study was carefully developed and structured with the assistance of the SFPCC. This included an orientation and training session for the alternative models on how to manage poison calls, then each participating group received four types of poison call simulations (informational, non-toxic, potentially toxic and fatally toxic). Actors presented the call simulations to the three participating groups. The call simulations were tape recorded to enable retrospective review by a poison control center assessor and a non-poison control center assessor. Assessors completed an assessment form for each call. The data from each assessment form was entered into computer spreadsheet software and evaluated by a university-based evaluation expert.

In addition to analyzing the results of the alternative model call simulation test, the data generated from the ED Log Review was analyzed. This entailed analyzing the data

collected from three hospitals in Contra Costa County to determine if there was a significant change in ED visits. The analysis was conducted by The Abaris Group.

Tasks & Methodology

Year Three involved evaluating two different parts of the overall study which were conducted in Year Two. One part was to analyze the data collected from the ED Log Review, and the second was to analyze the data generated from the alternative model call simulation.

Data collected during the ED Log Review was entered into a computer spreadsheet software program, edited, and proofed. Three months of data were collected prior to the block and during the block. The two time periods were then compared to each other for each hospital and statistically analyzed using the Chi Squared test.

The alternative model call simulation was conducted and data compiled into a format that enabled analysis. The final evaluation was completed by Daniel Bloch, Ph.D., an associate professor in the Division of Biostatistics, Department of Health Research and Policy at Stanford University School of Medicine. The Abaris Group provided Dr. Bloch with the data in an electronic format and a paper copy. Following preliminary analysis, the staff from the Abaris Group met with Dr. Bloch to review the progress of the analysis. Dr. Bloch conducted several types of statistical tests, using different statistical programs to analyze the data. John Oehlert, a statistical programmer with the department, also assisted Dr. Bloch with the analysis.

Despite careful study design and implementation, several considerations should be made when reviewing the results of the study. These include the limited amount of training provided to the participants, the use of a voluminous resource software program instead of a formalized poison protocol, use of a simulation model as the test of alternatives, potential for actor bias and realism, and the small number of alternative site participants. Within the scope of this study, every attempt was made to control for these considerations, however there were limitations that were inherent in the study and because of finite resources (funding, time, etc.) could not be addressed to the fullest extent desired.

Outcome

ED Log Review

The ED Log Review analysis did not reveal a significant difference in ED visits in Contra Costa County between the time period before the call blockage and the time period during the call blockage. During the interview process conducted during Year One, the Abaris Group received numerous anecdotal accounts of increased call volume regarding potential poison-related cases during the call blockage period, this was not reflected in the number of ED visits.

Alternative Model Call Simulation

Overall, the traditional poison control center performed best. The advice nurse group performed well, and the 9-1-1 PSAP did not perform as well.

In calculating the relative statistical significance between the models, Dr. Bloch used a number of statistical methods to draw his conclusions. Comparing the models, the traditional poison control center and the advice nurse assessments were not statistically significantly different as evaluated by both assessors for both the percentage of

passed/failed calls and the average total score. However, the traditional poison control center had a very high level of agreement among its participants, while the advice nurse group had moderate agreement. Because of the study design, it was necessary to look at each group's individual performance in order to evaluate the group as a whole since the study is assessing a type of alternative (an advice nurse program versus a 9-1-1 PSAP versus another alternative). The higher level of agreement among the traditional poison control participants means that most likely there will be a greater consistency in their responses as a group, while the moderate level of agreement among the advice nurse participants means that there may be an adequate level of consistency in that group's responses.

The traditional poison control center and the 9-1-1 PSAP percentages of passed/failed calls were not statistically significantly different as evaluated by both assessors, however the average total scores were significantly different as assessed by the Poison Control Center (they were not statistically significantly different as assessed by the Non-poison Control Center). As well, the level of agreement between the 9-1-1 PSAP was, thus pointing to a possible lack of consistency in the responses provided.

Finally, the average length of time of the calls for the advice nurse and 9-1-1 PSAP was significantly higher than the traditional poison control center for all types of calls.

A summary of the models and their relative performance is presented below.

Comparison of alternative Models to the Traditional Poison Control Center by Each Assessor

	Advice Nurse		9-1-1 PSAP	
	Average Score	Percent Passed/Failed	Average Score	Percent Passed/Failed
Poison control Center Assessor	Statistically Camparable	Statistically Comparable	Statistically Different	Statistically Comparable
Non-poison control Center Assessor	Statistically Camparable	Statistically Comparable	Statistically Comparable	Statistically Comparable
Average length of Time to Manage Calls	Significantly higher than traditional poison control center		Significantly higher than traditional poison control center	
Level of Agreement Between Scores for Each Participant Group	Moderately High		Moderate	

Conclusion

The Contra Costa County Alternative Model Poison Control Center Study provided invaluable information about designing an alternative program to traditional poison control centers. The study was designed to pilot test the ability of two alternative models to manage poison calls as compared to a traditional poison control center. While, the pilot test demonstrates the potential viability of an alternative poison center delivery model, more detailed study and control of variables will be necessary to fully conclude alternative model viability.

Regional Disaster Medical Health Coordinator (RDMHC)

Grantee:
Fresno, Kings, Madera EMS Agency
Project Number: EMS-5027
Project Period: 06/30/96-06/30/97
Project Amount: $39,979.74

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Introduction

Region V includes the counties of Kern, Tulare, Kings, Fresno, Madera, Merced, and Mariposa. In addition to these seven counties is Yosemite National Park, and the Kings Canyon and Sequoia National Parks. Fresno County is the coordinator for the Region V, RDMHC Grant. Currently, the preparation for response to medical disasters occurs through individual agency's and providers throughout the seven counties. The Fresno/Kings/Madera EMS Agency continues to develop the role of the RDMHC to coordinate the resources and functions within Region V.

Project Description

The purpose of this project was to continue the development of the RDMHC and further development of plans, procedures, and linkages within OES Region V. The goals and objectives are implemented to organize the infra-structure of the RDMHC and identify the resources in each of the seven counties. Once these resources were identified, the Regional Disaster Medical Health Plan could be developed and drafted for distribution to the counties in Region V. A planned exercise could then be completed to test, educate, and prepare the region for potential disaster responses. Regular meetings would be scheduled to continuously organize and coordinate the Regions business and preparedness for disaster.

Tasks/Methodology

The administration of the Regional Disaster Medical Health Coordinator Project was coordinated by the Fresno/Kings/Madera EMS agency staff. Staffing included both a project coordinator and funded a half-time EMS specialist within the EMS Agency.

The project set an objective to continue to develop, update, and distribute an annual listing of disaster medical resources within OES Region V. A questionnaire was developed last year and was distributed to appropriate agencies, facilities, and individuals to collect information for the resource directory as well as the EMS Plan. Many questionnaires were received and the information was input into the resource manual. The document will be distributed when the information is complete.

The Regional Disaster Medical Response Plan was refined through the review of the existing OES Region V Plan and other plans from other OES regions. Discussions with the RDMHC and State and Local representatives were facilitated to define the roles of the RDMHC staff for inclusion in the Regional Disaster Medical Response Plan. The Plan was also modified to include SEMS requirements.

Another task which was undertaken through the project was to facilitate the organization and implementation of a table

top exercise of the Regional Disaster Medical Response Plan on a local/regional basis. Multiple drills were performed locally with local hospital and provider agencies. The EMS Agency remains active in MARAC and LEPC.

Outcomes

The Regional Disaster Medical Response Plan was developed in draft and distributed throughout Region V. The new SEMS requirements were included in the draft and some RDMHC staff attended SEMS training courses. In addition, the EMS Agency also developed plans for the integration of HEICS into all area hospitals, as well as disaster communications. Disaster resources were identified throughout the entire Region V and data was input into a computer for the development of the Disaster Medical Resources Manual. Local drills and exercises were conducted to identify potential issues in preparation for more regionalized exercises. At the time of this report, very limited regional exercises have been conducted.

Conclusion

The RDMHC Project has given the EMS agency opportunity to standardize disaster response throughout the entire seven county region of Region V. The project will continue to improve the preparation and response to potential disasters through the fostered relationships with neighboring EMS agencies and the Office of Emergency Services at the state and local levels.

Critical Incident Stress Debriefing

Grantee:
Fresno, Kings, Madera EMS Agency
Project Number: EMS-5028
Project Period: 06/30/96-12/31/97
Project Amount: $13,729.09

EMS Administrator
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Introduction

Critical incident stress debriefing is a form of psychological debriefing developed as a method for mitigating the harmful effects of work-related trauma and preventing post traumatic stress disorder. Rescuers involved in life-threatening situations or traumatic events are impacted in many ways. The proper utilization of a trained CISD team can ultimately reduce costs and maintain a more stable workforce.

While some CISD services have been organized locally by a cooperative effort of local provider agencies, some areas of the region do not have access to these services due to lack of trained personnel. Access to critical incident support services as part of a coordinated CISD program is important to the three county region. These peer support teams provide initial assistance with follow-up from appropriate mental health professionals.

Project Description

The purpose of this project was to provide technical support, training, and coordination for the development of Critical Incident Stress Debriefing (CISD) peer support teams in Fresno, Kings, and Madera Counties.

This project allowed the EMS Agency to facilitate and assist in the formation of multi-agency (public and private) CISD teams which are accessible to all public safety agencies, dispatch centers, and hospital personnel throughout the region. The funding for this project was primarily used to train personnel who can respond to incidents where CISD is needed. With the training of personnel, the development of CISD teams were organized or used to stabilize existing programs.

Tasks/Methodology

The administration of the critical incident stress project was coordinated by the Fresno/Kings/Madera EMS agency staff. The assigned staff adhered to the program objectives which were included in the Critical Incident Stress Debriefing grant proposal submitted to the California Emergency Medical Services Authority.

The project set an objective to provide for the training and coordination of Critical Incident stress debriefing and assist in the development of CISD teams throughout the Fresno/Kings/Madera region. The EMS Agency contacted Jeffery Mitchell from International Critical Incident Stress Foundation, Inc. for the instruction of the course. A contract was developed and the CISD course was completed on June 12, 1997 and June 13, 1997.

Local agency representatives attended the course which allowed for the initial training and development of CISD teams in Kings and

Madera Counties. Additional people were trained for the Fresno County Team, CVEST.

Outcomes

Over two hundred people attended the two day basic CISD course. International Critical Incident Stress Foundation, Inc. supplied the books for the course and the EMS Agency provided the supplies and other materials. Fresno County contracted with a local hotel for meeting facilities and the provision of lunch for both days.

Local agencies were contacted for interest in the further development and maintenance of a CISD program. Kings County has an established CISD response team through Kings County and AMR. Madera County is still in the development stage but has expressed interest in sharing the responsibility with the California Department of Forestry. Eventually, a regional resource list will be developed for all CISD teams and members.

Conclusion

CISD is becoming another level of response to critical incidents where prehospital personnel are involved. There are still plans to integrate the CISD response into the EMS Communications Center and be activated on specific incidents. The grant funding provided the funding to begin the initial development of these critical teams.

Expanded Scope of Practice (EMT-I Trial Study)

Grantee:
Imperial County EMS Agency
Project Number: EMS-5029
Project Period: 06/30/96-06/30/97
Project Amount: $20,000.00

EMS Administrator:
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Introduction

The State EMS System Plan "Guidelines" direct local EMS Agencies to plan to eventual provision of advanced life support services throughout their jurisdictions (Section 1.08). There are two small, non-profit ambulance providers serving the remote communities in the north-end of the county. Typically, a paramedic or EMT-II will join one of these ambulance providers for a short time, and then leave due to the isolation, low call volume, and low pay. Fire department first responder agencies serving the rural and remote communities have never been able to provide ALS service as they are predominately volunteer agencies. The time commitment from the volunteers for training is minimal as most have full time jobs and families. The time commitment for paramedic and EMT-II training makes these programs unattainable for volunteers. We have established a need in our EMS System Plan (Objective 1.08.1) to develop innovative approaches to financial and training barriers that would enable EMT-Basic personnel to provide ALS services in the remote areas of the county.

Project Description

Implementation of an Expanded Scope "Advanced" EMT-I (AEMT) Program will enable the EMS Agency to accomplish its primary objective to have limited ALS available throughout the rural and remote areas of Imperial County. The major objectives include developing and implementing an AEMT program, providing sufficient continuing education opportunities for the AEMTs to fulfill their annual CE requirements, collecting the data necessary to determine if the program is safe and beneficial to patient outcome, and administering a Quality Assurance program for the trial study.

Tasks/Methodology

A preliminary plan was developed for the implementation of an Advanced EMT-I trial study program to include standards for provider approval, training program curriculum, skills and written competency testing, policies and procedures for continued competency, a continuing education program, data collection, and a quality assurance program. The plan was then submitted to a local AEMT Advisory Committee for review and approval. Courses were taught in accordance with approved training schedules, provider agreements were signed to provide the higher level of care, data was collected and reviewed, and continuing education addressed needs to improve the quality of the program.

Outcomes

The AEMT training program was completed as outlined and all grant objectives were met. The data collected indicated that AEMTs accurately assess patients and successfully provide advanced procedures

well before ALS would otherwise be available; patients conditions are improved by AEMT treatments; and that the quality assurance program in conjunction with the continued education modify and improve provider performance.

Conclusion

In summary, implementation of the AEMT program will enable the EMS Agency to accomplish its primary objective to have limited ALS available throughout the rural and remote areas of Imperial County. The AEMT program should continue and expand into additional areas of the county and we should experiment with added skills like intravenous fluid therapy as well as a trial of standing orders. The program may be valuable in other rural areas of the state. The AEMT concept may have benefit in urban areas where paramedic experience is diluted by increasing numbers of paramedics on first-response apparatus. The State EMS Authority and EMS Commission should consider amending the EMT-II regulations to recognize intermediate level providers.

Trauma Evaluation

Grantee:
Imperial County EMS Agency
Project Number: EMS-5030
Project Period: 06/30/96-10/31/97
Project Amount: $20,000.00

EMS Administrator:
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Introduction

The incidence of severe trauma is believed to be high for this rural area, although there has been no identification of severely injured patients and no evaluation of the overall quality of care. Serious injury is common, and frequently occurs in wilderness areas far from area hospitals. County hospitals are small and have limited resources. There is no organized team approach to the care of trauma victims. Tertiary care and designated trauma centers are located in neighboring San Diego and Riverside counties and in Arizona. Imperial County is similar to the North Coast area of California where a study revealed preventable trauma deaths were reduced by the implementation of a specially designed rural trauma system.

Project Description

This project set out to identify major trauma victims in Imperial County, evaluate the existing system response to trauma patients, and educate the EMS community about the benefits of organized trauma care. Field and hospital criteria were to be established for identification of major trauma patients. The coroner's office would be enlisted to identify all trauma deaths. The cooperation of local hospitals and the medical community would be enlisted for an evaluation of trauma care to determine if and how care could be improved. A trauma registry would be established to allow quantitative scoring of injury severity and comparison to established databases in the future. A Trauma Review Committee would be established to review trauma patient care and, if opportunities for system improvements were identified, they would be implemented to the degree system participants were willing and able to do so.

Tasks/Methodology

Field criteria was established to identify major trauma patients in Imperial County and a trauma registry was developed using existing EMS databases. A relationship was established with the County Coroner to review trauma deaths. Target hospital began a trauma QI program and has been performing case review on trauma care. Information on the value of organized trauma care was presented to representatives of area hospitals, EMS providers at Base Hospital meetings, members of the local Emergency Medical Care Committee and the Imperial Valley Fire Chiefs Association. All agreed on the need to develop a trauma program for rural/remote areas. The needs of trauma patients in Imperial County were identified. Current standards for trauma systems were reviewed. The target hospital established criteria for review of their response to trauma patients as part of their QI program. A mechanism was established with the coroner's office for reporting preventable deaths. At the present time, we have not been able to establish a Trauma Review Committee or reach an agreement with area hospitals and

medical staff to identify system needs through review of trauma cases.

Outcome

Reporting mechanisms are in place to collect information from field providers, target hospital and the coroner's office. Field criteria for identifying major trauma patients has been established and a trauma registry has been developed with the EMS database. Through the EMS system-wide CQI program, prehospital care of trauma patients was reviewed, areas needing improvement were identified, and suggested changes were implemented. However, we were not able to identify or implement overall changes in system response to trauma care without the medical community's participation and the formation of a Trauma Review Committee.

Conclusion

In summary, a foundation has been layed to initiate a trauma study in Imperial County. The EMS Agency is committed to achieving its goal of improving system response to trauma care and will continue to work towards this end in the years ahead.

Emergency Medical Dispatch (EMD)

Grantee:
Imperial County EMS Agency
Project Number: EMS-5031
Project Period: 06/30/96-06/30/97
Project Amount: $20,000.00

EMS Administrator:
John Pritting
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Introduction

Imperial County currently has a fragmented dispatch system with seven Public Safety Answering Points (PSAP) receiving "911" emergency calls from within their respective jurisdictions. These PSAPs use rudimentary criteria for classifying medical requests. They do not perform caller interrogation (beyond trying to ascertain the primary reason for calling), attempt to triage the level of response (all calls receive both BLS or ALS first response and ALS transport), or give pre-arrival instructions, and there is no mechanism for monitoring medical dispatching. Presently, none of our dispatchers have medical orientation or emergency medical dispatch training. These problems have culminated into an overall inefficient response of EMS personnel and equipment.

Project Description

Our overall goal in implementing an EMD program is to have trained emergency medical dispatchers using criteria based dispatch protocols who will effectively triage emergency medical calls, dispatch the appropriate level of response, improve the chances of survival from a life-threatening medical emergency by providing pre-arrival instructions, improve the availability of units for true emergencies, enhance the run capacity of existing units, reduce the costs associated with the inefficient dispatch of medical resources, and increase the overall efficiency of the EMS system.

Tasks/Methodology

Successful implementation of the APCO Institute EMD Program required bringing several components on line in sequential order. The first was to create a local EMD guidance committee to work in conjunction with APCO with the development of the EMD program. The Institute provided the guidance committee with a set of medical dispatch guidecard "proofs" for review. The guidecards were returned with medical control approval to the Institute with indicated changes to reflect local needs. Once the customized Emergency Medical Dispatch Guidecards were in place, the Institute began the Basic EMD training. Students used the customized guidecards to learn community protocols and practice EMD skills. An EMD Instructor course was then conducted. Having certified EMD instructors within our system will allow for local control of the scheduling of future Basic EMD courses as well as reducing the costs associated with training. The last step was to develop and implement a quality assurance and continuing dispatch education program designed to meet the needs of the local communication centers.

Outcomes

The EMD program was successfully

implemented by July 1, 1997 with two primary PSAPs in Imperial County and all grant objectives were met. Eighteen dispatchers were trained in the Basic EMD course and six personnel were trained as EMD Instructors. Quality assurance and continuing dispatch education programs were implemented and the first EMD QA reports submitted to the local EMCC in August.

Conclusion

In summary, implementation of the EMD Program has enabled the EMS Agency to accomplish its primary objective to increase the overall efficiency of the EMS system. The data collected indicates that having trained emergency medical dispatchers using criteria based dispatch protocols will effectively triage emergency medical calls and improve the chances of survival from a life-threatening medical emergency by providing pre-arrival instructions; and that the quality assurance program in conjunction with the continuing dispatch education modify and improve provider performance. Future goal is to expand the EMD program to all PSAPs in Imperial County.

Training Programs

Grantee:
Imperial County EMS Agency
Project Number: EMS-5032
Project Period: 06/30/96-06/30/97
Project Amount: $10,000.00

EMS Administrator:
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Introduction

Acquiring EMT-Basic or First Responder training for the rural and remote first responder agencies has proven to be difficult primarily due to the time commitment for training and the distance from the local community college. In addition, there has always been a high turnover of volunteers within these rural departments resulting in the loss of trained personnel. Work schedules make it difficult for volunteers from these remote areas to attend EMT or First Responder training at the college. The need exists to provide basic EMT or First Responder training in the rural/remote areas of the county to meet the needs of the volunteers and the first responder agencies.

Project Description

The EMS Agency will develop and implement training programs that meet the needs of the rural/remote first responder fire departments in Imperial County. These programs will be offered on a regularly scheduled basis as well as on an as-needed basis to offset the turnover of personnel within these departments. Training programs will meet all State requirements and standards and will not place undo hardship on volunteer personnel in regards to cost or time commitment. Training programs selected for this project are CPR/BLS, a First Responder Course, Early Defibrillation using Automatic External Defibrillators, and an EMT-I training program.

Tasks/Methodology

Implementing CPR/BLS, First Responder, Early Defibrillation, and EMT-I training programs began with selecting or developing course curriculum. Guidelines and objectives for training programs were adopted from the American Heart Association, the American Academy of Orthopedic Surgeons, and Title 22 of the California Code of Regulations. Policies, procedures, and protocols were written for the programs regarding certification, continuing education, and a quality assurance program. Scheduling of courses was coordinated with the Imperial Valley Fire Chiefs Association to meet the needs of the rural/remote first responder agencies.

Outcomes

EMS Agency training programs were developed and implemented as outlined and all grant objectives were met. The Health Department/EMS Agency was awarded designation as an American Heart Association BLS Training Center. The EMS Agency's First Responder - Defibrillation Course has been selected to be an integral part of the Imperial County Reserve Fire Academy. Brawley Police Department became the first law enforcement agency in Imperial County to participate in the early defibrillation program in Imperial County. The EMS Agency offers

ALS & BLS continuing education. With the implementation of an Emergency Medical Dispatch program in Imperial County, the EMS Agency also offers Continuing Dispatch Education as well.

Conclusion

In summary, this project has enabled the EMS Agency to offer EMS training programs (to include CPR, First Responder, Early Defibrillation, and EMT-I) in the rural and remote areas of the county that meet the needs of the volunteers and the first responder agencies. These training programs will be offered on a regularly scheduled basis as well as on an as-needed basis to offset the turnover of personnel, and will not place undo hardship on volunteer personnel in regards to cost or time commitment.

Trauma Data Collection

Grantee:
Kern County EMS Agency
Project Number: EMS-6034
Project Period: 09/01/96-08/31/97
Project Amount: $50,000.00

EMS Administrator:
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Introduction

After receiving the Emergency Medical Services Authority's approval of a trauma system plan, Kern County EMS Department devised to upgrade the existing Bay Area Trauma Registry (BATR) to a windows environment, and to develop appropriate input devices for the collection of trauma data from a future trauma center, receiving hospitals, rehabilitation hospitals, the Sheriff-Coroner and prehospital care providers.

With the assistance of a private consultant, the Department planned to revise the BATR to allow for direct trauma center data entry. To accommodate varying levels of automated data collection available, data from other system participants would be collected by the use of alpha-numeric "scanable" forms.

Project Description

The project was to provide for the revision and modernization of the BATR, fund the purchase of computer hardware and software necessary to effect the upgrade, and allow for the training necessary for a successful, integrated system of trauma data collection.

The project's first phase was to involve acquisition of a computer and other upgrades, work with a consultant to develop an interface for collection of trauma center data, and staff time devoted to development of scanable data collection forms.

The second phase of the project, as planned, was to provide for testing of data collection mechanisms, with formal evaluation, and necessary revisions.

Implementation of the new trauma data collection system, the third phase of the project, was to be the starting point for an ongoing quality improvement relationship between the Department and other system agencies.

Tasks/Methodology

Following conversion of the BATR to a windows environment, analysis by our software consultant revealed original programming errors and duplication of data fields too numerous to reasonably be corrected given the time and funding constraints of the project. The Department was left with two options: to attempt to repair the BATR; or, to develop a new application based on the BATR data dictionary. The latter option was chosen.

Department staff took on the considerable task of developing the data dictionaries. All existing data dictionary tables (37) and fields within the tables (1,511) were analyzed. After elimination of duplication, 8 tables and 631 fields remained. In order to provide for the collection of data from all system participants, as planned, additional tables and fields were added, until the revised

listing included a total of 11 tables and 740 fields.

Further analysis by the software consultant indicated that the revised tables and fields in their totality were beyond the constraints of available project funding. Another difficult decision was necessary. The Department elected at that point to concentrate on the initial collection and analysis of trauma center data, with other newly developed data tables and fields held in reserve for future development.

The data dictionary was provided in a beta version to the consultant, now featuring 4 tables and 228 fields. Testing and revision resulted in the Kern County Trauma Center Registry, a trauma center data collection and reporting application.

Outcomes

The Kern County Trauma Registry is a software data collection application designed for trauma center use. Designed for data entry at the trauma center, the Kern County Trauma Center Registry will require familiarity with trauma center operations, diagnostic and procedure code determination from medical records, and the Injury Severity Score ranking system consistent with the 1990 revision of "The Abbreviated Injury Scale" produced by the Association for Advancement of Automotive Medicine.

The Kern County Trauma Center Registry includes automated calculations of the Revised Trauma Score, Injury Severity Score and TRISS Probability of Survival.

Conclusion

Despite initial problems in identifying the extent of revisions of the BATR necessary to meet project demands, and the resultant scaling down of the project from its initial specifications, we believe the Kern County Trauma Center Registry as completed will provide an excellent basis for collection and analysis of data necessary for an effective trauma care system in Kern County.

Active use of the Kern County Trauma Center Registry will be implemented during planning stages of trauma center designation in Kern County. The Department will plan to implement use prior to actual trauma center designation in order to obtain a baseline of trauma care data. As a component of Kern County's continuous quality improvement efforts, this initial collection of trauma data will allow for "pre" and "post" trauma center comparisons.

Regional Disaster Medical Health Coordinator (RDMHC)

Grantee:
Los Angeles County EMS Agency
Project Number: EMS-5033
Project Period: 06/30/96-10/31/97
Project Amount: $80,000.00

EMS Administrator:
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Introduction

Region I includes the counties of Los Angeles, Orange, Ventura, San Luis Obispo and Santa Barbara. Los Angeles County is the Seat for the Region I, RDMHC Grant. While Region I comprise only 8 percent of the California land area (12,738 sq. miles) it hosts 42 percent of the state population (13,239,400). In addition, Region I has undergone at least eight federally declared disasters during the past five years. These declarations included fires, floods, earthquakes and civil unrest. The Federal Emergency Management Agency has spent more than $5.7 billion addressing these incidents.

Providing a systematic coordinated medical response including preestablished medical and health cooperative assistance agreements and maintained communication systems would reduce response time and care. This would subsequently reduce the economic and casualty costs associated with large disasters.

Project Description

The purpose of the 1996-1997 Regional Disaster Medical Health Coordinator Grant #5033 was to maintain the RDMHC staff position for OES Region I through the above fiscal period. Responsibilities of this position included but were not limited to the following: maintain and train Operational Area Disaster Medical Health Coordinators, develop and maintain disaster resource registries, create a Regional Disaster Plan, identify and implement training schemes, review the Regional communication system, conduct routine exercises, coordinate Medical and Health Cooperative Assistance Agreements, direct quarterly meetings, prepare quarterly reports, serve as liaison with public and private disaster response agencies and serve as an Agent of the State EMS Authority for all disaster correspondence, preparation, response and recovery.

Tasks/Methodology

The position of RDMHC staff has been maintained as part of the Los Angeles County, Department of Health Services EMS Agency. Operational Area representatives are maintained by individual county Health Officers. The resource registry was revised using Microsoft Excel and SPSS statistical packages to review and update listings more efficiently. Annual surveys were conducted to update and maintain these listings. Initially, the Region I, RDMHC Disaster Plan was prepared individually. It was later determined that a combined Southern Region Plan including all Operational Areas within the Regions I and VI would provide a broader, more systematic response approach. This decision was based on the high frequency of disaster related events within these two Regions and the recent completion of the Southern Region Cooperative Assistance Agreement. The Southern Plan was finalized

under the auspices of the Standardized Emergency Management System through the synthesized RDMHC Plans of Regions I and VI.

The Southern Region Cooperative Assistance Agreement was completed to provide a standard agreement for the request, mobilization and application of medical and health assistance. It was written through the combined efforts of all Southern Region Operational Areas.

Training schemes for SEMS and HEICS were provided through local EMS agencies, the Governor's Office of Emergency Services, private ambulance companies and area hospitals. Additional training in nonstructural hazard mitigation for hospital/clinic representatives was provided through the Annual Disaster Conference hosted by the Los Angeles County EMS Agency.

Regional disaster communication was maintained primarily through telephone and fax services. The OASIS satellite telephone provides contact among all regional and state EMS Agencies. Other regional communication instruments include the local HEAR radio system and the transportable satellite telephone system. In addition, the RDMHC is now connected to the Regional Information Management System (RIMS) created by the State OES.

Quarterly meetings, routine exercises, regional reports and appropriate correspondence were maintained through ongoing dialogue between Regional Operational Areas and the RDMHC.

The Geographic Information System continues to assist the region with mapping capability of medical facilities and emergency response agencies. This has proven helpful during exercises and for various planning issues. Further training and experience are required to provide the region with greater depth of service for analytical and statistical analysis for regional facilities.

Outcomes

Utilizing a permanent RDMHC staff person and subsequent Operational Area Disaster Coordinators has been beneficial in accomplishing grant objectives. All of the regional managerial disaster personnel have been trained in either the SEMS and/or the HEICS systems. OADMHC's have received additional training at the California State Training Institute (CSTI) in courses for disaster managers. The Satellite communications and newly acquired RIMS terminal has been instrumental in tracking regional exercises and real, disaster events. The completed Unified Southern Region RDMHC Disaster Plan and the Southern Region Cooperative Assistance Agreement have strengthened the Southern Regions ability to respond effectively and efficiently to emergencies and disasters.

Region I routinely participates in multiple local, regional, state and federal disaster exercises. These events provide ongoing training for regional disaster response activation.

These exercises have improved the systematic disaster response among all Region I Operational Areas and ensured a communication link in the event of wide-area telephone and/or power outages. Although the financial benefits are speculative, the potential for casualty reduction is well noted.

Regional GIS mapping schemes continue to improve overall planning and

response capabilities within Region I.

Conclusion

The overall implementation of the RDMHC Project has provided a unique opportunity to improve local and regional disaster preparation and response through active communication among all agencies, disaster training seminars and exercises, mutual aid establishments and standardized protocols.

Pediatric Airway Management

Grantee:
Los Angeles County EMS Agency
Project Number: EMS-5034
Project Period: 06/30/96-10/31/97
Project Amount: $34,648.00

EMS Administrator:
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(213) 890-7500

Introduction

The four-year Pediatric Airway Management Project was the largest study of its kind ever completed. The objective of the project was to study the effect on patient outcome of the addition of pediatric endotracheal intubation (ETI) to the paramedic scope of practice and to compare outcomes of patients treated with bag-valve-mask ventilation (BVM) and ETI in the out-of hospital setting.

Project Design

This was a prospective, randomized (calendar day) trial in two urban emergency medical services system, Los Angeles and Orange Counties. The project began by development of a unique educational program and audiovisual aids and then training nearly 2,700 paramedics in the skill of ETI and reviewed all aspects of pediatric airway control including BVM. The study began once the first paramedics completed the pediatric airway management education. During the study phase, pediatric airway management skills were randomized to even or odd days: BVM followed by ETI on even days and BVM only on odd days.

Tasks/Methodology

Investigators were paged for enrollment of each patient. Investigators and paramedics prospectively recorded out-of-hospital data on a standardized form. EMS Report forms, hospital records and coroner's records were reviewed for data. Data describing patient demographics, out-of hospital care times, out-of hospital and final diagnosis, airway procedure(s) performed and associated complications, mechanism of injury, ED and inpatient dispositions, hospital survival, and neurologic outcome were collected.

Outcome

Of 830 patients, 393 (47%) were randomized to receive BVM and 437 (53%) ETI. Fifteen out of 178 (8.4%) ETI patients were esophageally intubated or had unrecognized dislodgement, and died. Patient survival and neurologic outcome were not affected by type of airway procedure used. For ETI, scene times are longer and mortal complications are high. ETI does not increase survival and BVM has fewer serious complications. As a result, BVM is the preferred method for pediatric airway management.

Conclusion

The Pediatric Airway Management Study is of highest quality and will have far-reaching impacts. It was designed by non-biased investigators, had an excellent randomized study design, and contained statistically appropriate patient numbers. More than 800 patients were randomized to

either ETI or BVM ventilation. Children receiving BVM had outcomes just as good or better than those managed by ETI. In fact, there was a trend toward better outcome for children receiving BVM ventilation. In looking at a number of different patient subgroups, such as near drowning, no subgroup proved ETI was superior to BVM. The investigators believe these results are similar to previous, less-well performed studies, and that our overall rates of survival in respiratory and cardiac arrest are as good or better than reported by other EMS systems.

The Pediatric Airway Management Study has been a landmark undertaking in the history of EMS in Los Angeles and Orange Counties. While the focus was on potential differences between ETI and BVM ventilation, an array of other information has been discovered, including continuing education issues, data regarding drug dosage, value of Magill forceps in foreign body removal and other clinical issues. In addition, the educational component of the study substantially improved the overall level of care and management of pediatric patients in Los Angeles County.

Further details of the study will be available after journal publication.

TEMIS/Data Conversion

Grantee:
Los Angeles County EMS Agency
Project Number: EMS-5035
Project Period: 06/30/96-06/30/97
Project Amount: $21,600.00

EMS Administrator:
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Introduction

The Los Angeles County Trauma Emergency Medical Information System has a volume of over 550,000 EMS records per year. Currently, data from each provider agency (except Los Angeles City Fire, who has an independent database) is obtained from hand written EMS Forms mailed to the EMS Agency.

Due to the volume of EMS Forms and the incomplete and inaccurate demographics and times associated with the incident, system reports are difficult to produce resulting in an incomplete system review. The EMS Agency routinely informs fire departments of the problem with incomplete/inaccurate documentation by field personnel. Accountability for the accuracy of the field documented data is difficult in that fire departments have repeatedly complained of the "double data collection" for their own computerized system and the hand written EMS Form, and do not follow through with education on this issue. Many fire departments have internal data systems which collect minimal EMS data. However, the demographic and time related data is accurate in that it is obtained from dispatch records.

Project Description/Tasks

A conversion program has been written to obtain all appropriate EMS fields from fire department based computerized systems. Once a record has been identified through the use of a unique identifier (Sequence #), additional medical data elements can be entered from the hard copy EMS Form. The end product is a more accurate and timely record.

Outcomes

Outside computerized data has been received and converted into TEMIS language, allowing for additional elements to be entered. One problem encountered, however, is the incoming data originally was entered in such a manner as to not enable an accurate match with hard copy records. This is true with multiple victim incidents where there are multiple BLS/ALS units providing patient care/transport. It is virtually impossible to identify which unit cared for which patient. As the number of these calls are small in comparison to the entire database, the problem is not insurmountable. Multiple victim incidents are isolated out and primarily entered from hard copy documentation with computerized data used to verify demographic and time data fields.

Conclusion

While this task is ongoing, the benefits will be easily recognized as the program begins to be routinely utilized. The ultimate goal is to have provider agencies recognize the importance of having their own complete computerized EMS data systems. While the

agencies are slow in adapting, as QI programs within each agency become more sophisticated, the need for such databases is being understood. A few fire departments have approached Lancet Technology for assistance in creating databases not only for EMS but all fire department activities.

Implementation of Project S.A.F.E.

Grantee:
Marin County EMS Agency
Project Number: EMS-5036
Project Period: 06/30/96-60/30/97
Project Amount: $19,500.00

EMS Administrator:
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Introduction

Marin County is located in an area at high risk for disaster. School surveys done in 1990 and 1992 documented need for improved communications, better information and training and help building more effective disaster/safety plans. The 1996 Grand Jury identified the need "...to offer training programs in a structured, simple manner utilizing whatever sources are available..." and urged that "...specific classes be held that address the issue (of safety and preparedness) at the school level... (to) better alert and involve the entire family to... offer constructive help via information and education."

Despite efforts to accomplish these goals, the Marin County Office of Education confirmed wide variation in the level, frequency and content of student exposure to vitally important safety information.

Project Description

The project was to implement Project S.A.F.E. (Student Activities for Emergencies), previously developed by the Alpine, Mother Lode, San Joaquin Emergency Medical Services Agency, in Marin County. The target audience was sixth grade students in both public and private schools.

The major objectives were as follows:

C To prepare for class presentations;
C To conduct Project S.A.F.E.. events;
C To evaluate the impact of the program on individual students; and,
C To develop one or more committed funding sources.

Task/Methodology

A staff member was assigned responsibility for project management, organizational support was solicited, the project was highly publicized, volunteers were solicited and presentations scheduled.

Pre- and post-evaluation tools were developed, as were evaluation tools for use by instructors and schools. The curriculum was reviewed and decisions made regarding "core" and "optional" stations. Station information was reworked and a procedure for organizing individual presentations was established. Routinely used forms were created.

Presentations were followed with evaluation by students, instructors and schools which were reviewed to determine effectiveness of the program and to adjust presentations.

All actual costs of the program were tracked, allowing an accurate forecast for subsequent year's presentations. Hours for project management have been incorporated into the job description of a current employee and financial support solicited to assure

continuation of the project.

Outcomes

Project S.A.F.E. was presented to 2260 students, over 90% of the sixth grade students in private and public schools in Marin County. Twenty-one presentations, of one or two sessions per presentation, were conducted, with thirty-one different agencies participating.

This program is the first county-wide multi-disciplinary student education program available. Although not specifically measurable, it is assumed that a consistent, wide-spread educational effort focused on safety and accident prevention will positively impact the health of individuals and the community.

The revised Project S.A.F.E. program manual, including the evaluation tools and checklists developed, will be available to anyone wishing to implement the program in their area.

Conclusion

The Implementation of Project S.A.F.E. was a positive experience for all involved. Public and privately owned agencies only peripherally involved with each others' activities on a daily basis worked together consistently and well. In the process, they established relationships that will be of benefit in other collaborative efforts. Students learned skills that may positively impact their lives or the lives of others and learned that their actions can make a difference.

Disaster Medical Preparedness

Grantee:
Marin County EMS Agency
Project Number: EMS-6035
Project Period: 09/01/96-11/30/97
Project Amount: $49,000.00

EMS Administrator:
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Introduction

Like all counties in the San Francisco Bay Area, Marin County is located in an area at high risk for a large-scale disaster, with access roads that will be severely restricted or unavailable.

No comprehensive plan existed to guide disaster workers should significant relocation of victims be necessary. Facilities such as physician's offices, medical clinics, and free-standing minor care providers were not a part of the disaster medical planning process. There was no mechanism in place to facilitate the utilization of professional medical personnel at any facility at which they were not previously employed.

It was imperative that appropriate planning for the provision of medical care in the Marin Operational area during a disaster be addressed before the need to provide that care arose.

Project Description

The project sought to develop a comprehensive medical/health disaster plan. Objectives for the project included the following:

- To prepare to begin implementation of the project;
- To establish a steering committee to review overall medical/health disaster needs and work toward the establishment of a comprehensive medical/health disaster plan;
- To identify potential Field Treatment Sites and contract for use of those sites;
- To identify and contract with physician offices, medical clinics, free-standing emergency care providers to provide specified services and personnel during a disaster;
- To identify and contract with a personnel registry to process and provide medical staff according to need and as requested by Operational Area EOC during a disaster;
- To upgrade current medical supply caches to the "Kit III" level; and
- To establish a plan and mechanism to maintain medical supply caches in conjunction with non-medical supplies needed for care centers.

Tasks/Methodology

A Project Manager was contracted for the duration of the project and resource documents were assembled for use by staff and the steering committee. Whenever possible, existing resources were utilized and a sizeable library was developed.

Appropriate agencies were invited to participate in the planning effort as members of the steering committee, whose purpose was to review overall medical/health disaster needs

and to work toward the establishment of a comprehensive plan. It became obvious, as the planning process developed, that the involvement of other county agencies and programs was necessary, and those community agencies (in addition to hospitals) had a vital interest and needed to be included in the process.

Sites suitable for designated uses (Field Treatment Sites, Disaster Medical Services Facilities) were identified and the process for contracting with them begun. Criteria for inclusion were drafted, contract templates developed, and the desired sites approached. Although interest in participating was high, the actual execution of the contracts was, and is a lengthy process.

A personnel registry was found that would relocate following a disaster and would process and provide technical medical staff as needed to provide and/or augment staffing for medical facilities.

Three existing medical supply caches were upgraded from a "Kit I" to a "Kit III" level. They are intended to be utilized to provide equipment and supplies for Field Treatment Sites. Budget changes requested late in the grant cycle provided for the completion of this activity by the end of the extended grant period. A plan and mechanism for the maintenance of medical supply caches in conjunction with non-medical supplies were established, perishable supplies were separated from non-perishable. Perishable medical supplies are stored, rotated, and provided within two hours of notice from one of three private pharmacy sites within Marin County.

Responsibility for the oversight of the medical supplies was incorporated into the job description of the EMS Specialist, a full-time staff member of the EMS Office.

Outcomes

This project, although not complete in itself, has resulted in the development of the logistical abilities that will support the activities of the Operational Area Disaster Medical Health Coordinator in the accomplishment of his/her assigned tasks.

It is a necessary adjunct to the planning that is occurring during Phase II, which is developing the Medical/Health Disaster Plan (a departmental operations center) that will utilize these agreements and provisions to support medical and health activities within Marin County.

Conclusion

The project has been valuable, operationalizing necessary medical and health-related activities and providing implementation ability to the Operational Area Medical/Health Branch that has previously been theoretical.

If approaching a similar project, a suggestion would be to approach the project less intensively, spending less hours per week, but over a longer period of time. Project staff found their ability to move rapidly slowed by the rate at which outside agencies were able to participate in a project not high on their priority list.

The project began an interface with outside agencies that will result in unique private/public partnerships.

Trauma System Plan

Grantee:
Merced County EMS Agency
Project Number: EMS-5037
Project Period: 06/30/96-10/31/97
Project Amount: $29,744.00

EMS Administrator:
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Introduction

It has been demonstrated in EMS systems throughout the nation that an organized, systematic approach to trauma care results in decreased morbidity as well as a reduction in preventable death.[1] As Merced County has no formal trauma system in place, the State EMS Authority funded a special project during FY 1995-96 to develop a rural trauma plan for this system. This special project to implement the trauma plan followed on the heels of the planning process and allowed us to take advantage of the momentum gained during the trauma plan development.

Final implementation of the plan has not been completed at the time of this writing, but we anticipate agreements with the Major Trauma Receiving Centers and formal implementation by July, 1998. What follows will describe the process and the accomplishments of this trauma plan implementation special project.

Project Description

This project set out to implement a state-approved trauma plan for a rural area in the Cental Valley of California. This plan envisioned either a Level III designation for one of the local hospitals or EDAT designations for one or more of the facilities. In addition , the plan anticipated contracts with two hospitals in Modesto as Major Trauma Patient Receiving Centers (MTPRC [Level II Standards]). The major objectives of this project were as follows:

- To contract for a trauma consultant experienced in Trauma Plan Implementation processes.
- To develop and issue an RFP instrument for all levels of participation.
- To finalize all necessary system documents.
- To provide for prehospital personnel training.
- To integrate agency data system with participant trauma registry.
- To initiate Trauma Advisory Committee.
- To blend injury prevention project into emerging trauma system injury prevention activities.
- To designate facilities at MTPRC (Level II), Level III (as appropriate) and EDAT.

Tasks/Methodology

The consultant that assisted the agency in the development of the trauma plan (The Abaris Group) was retained to assist in the implementation of the plan. The consultant provided the county with a template for the Request for Proposals (RFP) for trauma

[1] Cales RH, Trunkey DD: Preventable trauma deaths, A review of trauma systems development. JAMA 1985

facilities, and the Department of General Services completed preparation and distribution of the RFP. Four facilities submitted proposals; two for the MTPRC category and two for the EDAT category. The proposals were reviewed both by county officials as well as an expert site survey team retained to provide recommendations to the agency regarding facility designations/contracting.

Preliminary training of field personnel regarding the trauma plan was conducted, however, final training on the specific triage criteria to be utilized was delayed pending determination of the facility designations and any required adjustments to the triage instrument.

A Trauma Nurse Coordinator position has been established within the County Human Resources structure, and the position will be on-board at the agency by March, 1998. This position will be responsible for the trauma system oversight, establishment and staffing to the Trauma Advisory Committee, Injury Prevention integration and overall trauma system quality improvement.

A site survey was conducted at each applicant hospital, and final reports and recommendations from the site survey team were produced. As a late development, the surgical community expressed reservations about the Merced area hospitals participating at the EDAT level, as there are only five general surgeons taking call for the community. They felt that formal designation would, as a practical matter, increase their on-call requirements to an unrealistic level. As a result, the hospitals within the county will remain at the Receiving Emergency Department status with Designation of two MTPRCs in Modesto.

Outcomes

The primary outcome of this project has been the formal adoption of trauma triage criteria and formal contracts with receiving centers for our most critical trauma patients. Triage, to date, has always been informal, without anatomically or physiologically-based criteria to aid in these decisions and, as a result, has been inconsistent. The tool produced through this effort is a consensus document, refined by all of the stakeholders, and has achieved broad-based support. This achievement constitutes a major step forward for this jurisdiction by bringing a level of predictability to patient destination patterns.

In addition, this process has required the hospitals to turn the microscope inward and conduct a thorough self evaluation with regard to their own internal policies and procedures for managing trauma victims. We are confident that this process has and/or will improve their management of trauma cases and awareness of opportunities for improvement.

Conclusions

While this trauma plan implementation process has not achieved all of the original goals articulated in the proposal, it has greatly enhanced our ability to manage trauma victims; capture detailed data regarding these cases and, more importantly; set the stage for a process of continually monitoring and improving on the initial trauma system configuration. It is important to remember that to have reached this point in trauma plan implementation in this area is a major accomplishment, given the dismal history of trauma system development in this area of the central valley.

While we had both a general and orthopedic surgeon on the trauma plan

development task force, we nonetheless ran into problems with implementing the plan (locally). For future reference, we will probably ensure that proposed changes to the plan have a wide distribution among all of the stakeholders, particularly the surgical community, regardless of the task force makeup. By doing so, we should be able to reduce the degree of contention for implementation and a garner much broader support for the system.

Information Data Management

Grantee:
Merced County EMS Agency
Project Number: EMS-5038
Project Period: 06/30/96-06/30/97
Project Amount: $113,264.00

EMS Administrator:
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Introduction

Information management is a key responsibility of the local emergency medical services agency and its importance has grown immensely over the past several years. Change in the health care delivery system is occurring at a pace which often out-distances the accurate analysis to drive such change, and most systems are not prepared to properly evaluate the impact of such change.

In addition, information analysis should drive the quality improvement activities at the system level. The emerging health care model is best served by the close coordination between all parties to the system, and EMS agencies should facilitate the standardization of quality indicators across much larger health care delivery areas. There is currently little consistency in defining quality between the 32 EMS agencies in California. In an effort to address these issues, Merced County was granted a special project to develop a state-of-the-art management information system and coordinate with surrounding EMS agencies for the development of global quality improvement standards.

Project Description

This project had several objectives which were designed to improve the depth and accuracy of the data collected in the prehospital environment; establish the integration of prehospital, emergency department and trauma system information; define global quality standards/indicators for the prehospital setting that can be applied in any EMS system and to integrate injury prevention data collection into the prehospital patient report software being developed as part of this project.

Tasks/Methodology

A data consultant was sought utilizing a standard county request for proposals. Criteria were developed by the agency listing the desirable qualifications and obligations of a data consultant for this project. The intent of the agency was to incorporate the data standards promulgated by the National Highway Traffic Safety Administration (NHTSA), EMS Division, as well as the fields necessary to identify the external cause of injury codes (E Codes) of the International Classification of Disease, 9th edition (ICD-9) coding structure. To that end it was important to ensure that the data consultant was willing to build a data structure from the ground up, with substantive customization.

Prior to development of the software, numerous meetings were set up between the agency and participant hospitals in this system to review the specifics of the project and to afford them an opportunity to comment and make recommendations regarding the data requirements. Each hospital was site visited and the scope of the project discussed. In an effort to gain the participation and cooperation

of the hospitals, we included the purchase of a computer for each facility in the grant funding, as well as the development of the necessary software (receiving facility ambulance log database).

During the software development discussions with the consultant, numerous development products were reviewed. As the agency and ambulance provider have computer systems utilizing Windows®95 and Microsoft products, the decision to go with a Microsoft Access 97® based product was very straight forward. This decision facilitated utilizing the Windows®95 Dial-up Networking process for the transfer of data via modem. All of the computers purchased for use at the facilities also came with the same software. Additionally, as the current agency database was developed in Microsoft Access, staff are already familiar with the interface which will provide for ease of data query and report development, both routine and ad hoc.

In choosing a trauma registry, selection criteria were established as follows: 1) The software must be Windows95 compatible, preferably developed for the Windows95 environment; 2) It must be easily exported in formats typically used by Windows products (DBF, XLS, ASCII); 3) It should have an intuitive graphical user interface for ease of use; 4) It should have the ability to codify free text entries for diagnosis (ICD-9-CM) and calculate Abbreviated Injury Score (AIS), Injury Severity Score (ISS) and Probability of Survival (PS); 5) It should be customizable, and; 6) We had to be able to purchase three copies of the software (with training) for no more than $22,000.00. Based upon these criteria, Collector® from TriAnalytics was chosen.

One of the primary issues of the new MIS development was the ability of the agency to continue to capture "external cause of injury" coding (E-Code) data for use in our injury prevention efforts. This data is currently completed by the field paramedics using paper checklist forms and then entered into the database by a data clerk. Each of the E-Code components (previously captured on paper forms) is captured by fields in the PCReporter[1] for the compilation of external cause of injury coding by the agency.

Defining quality standards for the prehospital environment was a major objective for this project. As there are no "gold standards" upon which to measure one's system, such as the standards of care established by organizations like the American College of Surgeons, American Heart Association, etc., we wanted to produce "global standards" which might be applied in any EMS system. Contracts were executed between Merced County and the Mountain-Valley and San Joaquin County EMS agencies to collaborate with us in this endeavor. Eight quality standards were established and each standard was fully discussed and broken down into individual evaluation indicators.[2]

Finally, in an effort to facilitate the participation of the area hospitals in collecting additional emergency department data, we purchased IBM compatible Pentium computers for each, as well as developed a software product for their use in collecting this data.

Outcomes

The following items were produced as a result of this project:

C A Windows95-based patient care

[1] The name of the EMS database.

[2] The goal was to define indicators which should be extractable from the agency patient care database.

report development software program for use on field laptops as well as an agency version for the compilation of data.

- A quality improvement document which represents the collaboration of three EMS agencies in producing global standards for defining quality in prehospital patient care.
- A hospital ambulance log software product for the capture of emergency department (ED) ambulance patient data and initial ED vitals, diagnosis (ICD-9-CM coded) and patient disposition which integrates with the agency information system.
- A 51 page data elements/definitions document mapping the database structure, table relationships and field definitions.

Conclusions

This project succeeded in producing a state-of-the-art, Windows95-based information system, the integration of prehospital, hospital and trauma registry data, quality improvement standards that can be globally applied in any EMS system and has laid the foundation for developing outcome-based research projects to aid in defining system changes for this EMS system in the future. We have moved to validated patient care data input/report production from the source (paramedics), thereby reducing the likelihood of error and improving the quality improvement feedback loop time-lag immensely. We are confident that this project has produced both the information capture methodology and the upgradeable software necessary to meet the agency's information needs for the foreseeable future.

Trauma Registry

Grantee:
Northern California EMS Agency
Project Number: EMS-5039
Project Period: 06/30/96-06/30/97
Project Amount: $35,000.00

EMS Administrator:
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Introduction

An aging, increasingly dysfunctional, Regional Trauma Registry with its origins from the Bay Area Trauma Registry, prompted Nor-Cal EMS to obtain a trauma registry development grant. Many of our trauma facilities were no longer able to transfer their trauma data via disk to Nor-Cal EMS, leading to incomplete data at the LEMSA and a complete reliance on the trauma facilities to perform all QI activities without the oversight of Nor-Cal. Additionally, the Regional Trauma Registry was nonfunctional with any operating system but Windows 3.1 or older. So, hospitals that were attempting to convert to faster hardware and operating systems were having significant compromise of their trauma registry. Of our seven trauma facilities only two were financially capable of independently purchasing new software, leaving our other five without a trauma registry that was integrated with the trauma system.

Project Description

The primary tasks of the Trauma Registry Project were to permit Nor-Cal EMS to plan, develop and implement a replacement regional trauma registry software capable of measuring the effectiveness of their regional trauma system, and to help further state and local trauma system development and support.

Tasks/Methodology

To remedy the trauma registry deficiency identified, Nor-Cal EMS utilized existing state and national developments to rewrite the existing Regional Trauma Registry in a new relational database platform, specifically Microsoft Access. A literature review process was followed that involved trauma registry and trauma care system research. In addition to the Department of Health and Human Services National Trauma Care System Data Set, six primary existing trauma registry software applications were reviewed. The focus of the development of the registry was on reducing data input and output cost, increasing data and software reliability and expanding data access.

Upon completion of the prototype, the new registry was subjected to an extensive seven phase alpha/beta testing process: (1) Alpha testing by an independent tester (unfamiliar with trauma registries); (2) Reprogramming; (3) Additional Alpha testing; (4) Comment from the Trauma Registry Users Group; (5) Reprogramming; (6) Alpha testing; and finally (7) Beta testing by a pilot facility with actual cases. Additional facilities were added as they obtained the necessary hardware to support Microsoft Access 97. Developed by HealthWare Solutions, the result consisted of an entry level, regional trauma registry software program designed to measure the effectiveness of a regional trauma system.

Outcomes

To date, February 27, 1998, the new regional trauma registry has been installed at six of the seven trauma facilities. The seventh facility has a functional Regional Trauma Registry, and does not have the funds to upgrade its hardware. Of the six hospitals utilizing the new regional trauma registry, all are experiencing problems. Data entry is different and in some cases more cumbersome than with the Regional Trauma Registry. Reports are not currently reliable resulting in an inability to evaluate our trauma system. Work is continuing with HealthWare Solutions to rectify the problems of the program. Currently, a five week plan of changes is being implemented after an intensive review by all of the participating hospitals.

Conclusion

Currently, the new trauma registry has consumed a very large amount of time and energy from both the trauma facilities and their personnel and the trauma director. Trauma facilities have committed a limited amount of future support for the new trauma registry, and without correction of the design problems, will withdraw their support if that resolution does not come in the near future. A sound modification to the process would be having a trauma registrar/coordinator as the tester and not someone unfamiliar with trauma registries. Another concern is when and how old data will be converted to the new trauma registry, which was not adequately addressed in the project. Accuracy of the data during the conversion from the old to the new trauma registry is an additional concern.

Emergency Medical Services for Children (EMSC)

Grantee:
Northern California EMS Agency
Project Number: EMS-5040
Project Period: 06/30/96-06/30/97
Project Amount: $75,000.00

EMS Administrator:
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Introduction

The Nor-Cal EMS region has had a system of Emergency Departments Approved for Pediatrics (EDAP) for a decade. This project was the first of two undertaken to update and expand services for children to remain contemporary in their care and injury prevention.

Project Description

This project began the process of modernizing and better coordinating emergency care of sick and injured infants and children in the field, emergency department, critical care unit, trauma center, and during inter-facility transfer. Also included were assessment of rehabilitative services and work in injury and illness prevention. A structure was established to provide continued evaluation and evolution of the region's EMS for Children efforts for the future.

Tasks/Methodology

Two project consultants-- an RN and a physician, both with comprehensive experience with EMSC system development in California, and a coordinator were recruited and contracted to provide staff work for the project. The consultants provided indispensable expertise. Although the project enjoyed the participation of many clinicians with pediatric experience, the consultants' backgrounds in coordinated EMSC system development and experience with similar efforts was essential.

A multi-disciplinary task force was formed, including field provider leadership, ED, pediatric, and ICU nurses, physicians including emergency, adult and pediatric intensive care, and pediatric specialties, and agency staff. Subcommittees of the task force were formed in the areas of field care, emergency departments, and critical care centers/trauma centers/inter-facility consultation and transfer. The subcommittees developed draft guidelines for staffing, education, supplies and equipment, policies/procedures, and other items, which were submitted for input and approval of the task force, then distributed for public comment and medical review. Task force meetings were held monthly, with subcommittees meeting as each deemed necessary. Meetings were managed as informal, consensus-driven discussions.

The California State EMSC guidelines and existing EDAP program provided the model for this program. Some features were adopted without change, while others were modified to reflect the unique nature of the region.

A comprehensive collection of resources was accumulated during the project, and an up-to-date list was provided to task

force membership and others at each meeting.

Outcomes

The structure is now in place to establish and maintain an effective EMSC program. The task force received enthusiastic participation and support from the region's EMS and pediatric communities, and seems set to guide pediatric care issues for the foreseeable future. Drafted documents include ED guidelines, field protocols, and inter-facility consultation and transfer guidelines. The EMSC resource list currently includes nearly 60 documents and resources.

Conclusion

This project established the structure and methods to establish and maintain an EMSC system in the Nor-Cal EMS region which will provide continuing implementation and evaluation of pediatric emergency care across the whole spectrum of EMS. The necessary groundwork was laid to proceed effectively during the 1997-98 EMSC project. The groundwork laid during this year will promote an effective EMSC system to serve the residents of and visitors to the eleven northeastern California counties for many years to come.

Prehospital Care Reporting/Data System

Grantee:
Northern California EMS Agency
Project Number: EMS-5041
Project Period: 06/30/96-06/30/97
Project Amount: $110,000.00

EMS Administrator:
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Redding, CA 96002
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Introduction

The California EMS Authority's support of EMS data systems has yielded the California Prehospital Care Reporting & Database System (PCR-DS). At the onset of the project implementation of the system in the Northern California EMS region was not complete, the diverse needs of the EMS community were not fully met, and a comprehensive EMS information/TQI component didn't yet exist.

Project Description (Objectives)

1. To executive all contractual obligations with the California EMS Authority.

2. To reduce morbidity and mortality through implementation of integrated Data-CQI.

3. To reduce administrative cost by at least 50% and increase effectiveness of the PCR-DS by instituting and coordinating a multi-regional Administration and Support Component.

4. To maintain cost-efficiency and innovation of the PCR-DS by pursuing the R&D Component.

5. To increase LEMSA data access and utilization by 50% through development of additional custom modules.

6. To reduce redundant data entry by 15% and increase integrity of trauma registry data through the integration with the PCR-DS database enterprise.

7. To continue a coordinated effort of statewide data support.

Tasks/Methodology:

1. Contracts were executed; meetings were held to provide education, input and feedback and coordinate project activities.

2. Project personnel utilized input from identified groups and others. Reports were developed to answer the questions posed by these activities, and the database dictionary and program modules were modified to accurately capture new data elements needed to generate the new reports. Additional enhancements were completed based on input from participants.

3. Project personnel proposed to focus on multi-region PCR-DS development and maintenance using LEMSA database administrators for primary training, implementation, and technical

support, with project personnel to support them. Long-term financial support strategies, agency representation, research and development, multi-regional data aggregation, and state reporting were to be considered. Re-establishment of the multi-regional PCR-DS task force was proposed to provide equal local representation, discuss local issues, make recommendations, and provide technical support and guidance on data utilization.

4. Project personnel proposed to continue investigation in the development/expansion of EMS data linkages, a single data enterprise, communication, voice and other technologies, and automation of ad hoc queries. Input was solicited from all LEMSAs using the PCR-DS.

5. Project personnel proposed to investigate and develop custom interface modules to permit unique LEMSA data access. This was to include provider table expansion and construction of an interface similar to Certification or QI modules, specific to the needs of administrators.

6. Project personnel proposed to add abilities to link with the new trauma registry, incorporate data export or attachment functions to download prehospital data to the trauma registry, and create a mechanism to initiate a trauma registry record for patients meeting defined criteria. Patient and accident information were to be broadened.

7. Project personnel proposed to continue toward statewide database development. Technical assistance was provided to local agencies. The PCR-DS task force was continued.

Outcomes

A State model EMS-MIS has been developed into an elaborate information network. A data management system was designed which reflects current State EMS Data System Standards and local needs, and is user friendly for data input and output. The system yields a high quality medical/legal patient care document and collection of reliable and valid information. Reports are immediately available, security access has been increased, report generation and transfer are possible by provider, and data linkage with other regions is possible. LEMSA modules include Certification, Database Administrator, and CQI Manager. The system is remarkably practical.

Conclusion

Users have revealed problems with maintaining certification files, transmitting data, performing month end PCR administration, and needing more user friendly screens. Possible reasons could be attributed to failure to load the program properly, incompatible hardware, hardware failure, poor quality phone lines, and personnel unfamiliar with the program. It is the intent of NorCal EMS to determine the causes and assist with corrections so the program can be fully utilized.

Regional Disaster Medical Health Coordinator (RDMHC)

Grantee:
Northern California EMS Agency
Project Number: EMS-5042
Project Period: 06/30/96-06/30/97
Project Amount: $39,800.00

EMS Administrator:
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Introduction

The designation of an official Regional Disaster Medical Health Coordinator for OES Mutual Aid Region III is a fairly recent event as compared to other regions. Prior to this designation, there was no generally accepted focal point for coordination of medical personnel and resources on a regional basis. The historic lack of a regional coordinator, of course, meant a lack of infrastructure and process geared toward the RDMHC position and function. With assistance from this grant project, Nor-Cal EMS has continued to support the agency's Medical Director in the assumption of responsibilities as RDMHC to facilitate the planning and implementation of regional disaster response capabilities.

Project Description

This project's goal was to improve the regional preparation for disaster response through coordination of resources from operational areas within the region, through education of regional personnel and by providing a mechanism for coordination of resources between operational areas and the state. Adherence to objectives promulgated by the state of California insured that project activities were consistent with the statewide medical mutual aid plan.

Tasks/Methodology

Objectives:

1. To establish, by 30 June 97, a Regional Disaster Medical/Health Response Plan and Standardized Operating Procedures in concert with the Standardized Emergency Management System (SEMS) and RDMHC guidelines as issued by the State.

2. To facilitate the appointment of Operational Area Disaster Medical/Health Coordinators.

3. To facilitate the development of operational area medical/health mutual aid agreements throughout the region for the coordination and acquisition of medical resources to aid in a disaster response.

4. To implement and incorporate SEMS according to the RDMHC responsibilities identified by the RDMHC Response Plan and Standardized Emergency Management System Guidelines.

5. To establish periodic meetings with operational area disaster medical/health coordinators, OES staff, fire and law representatives, public and environmental health planners, hospital representatives and

health care facilities planners to discuss, develop and implement the Regional Disaster Medical/Health Response Plan and component elements.

6. To conduct a minimum of two regional exercises per contract year to provide training for operational area participants, test and refine procedures and promote preparedness.

7. To identify and facilitate training for operational area personnel in the Standardized Emergency Management System by 1 Dec 96.

8. To coordinate and facilitate local and regional health care facilities training on Nonstructural Hazard Mitigation and the Hospital Emergency Incident Command System.

9. To identify a regional disaster medical/health communications system to manage information and resource requests in the region and/or designate an appropriate frequency for use in the event of a regional disaster by 30 June 97.

Progress toward these objectives, while not complete, has been made primarily through repeated distribution of education materials, workshops and regular meetings with key personnel. Good working relationships between the RDMHC staff, EMSA, DHS and OES have accounted for much of the progress that has occurred.

Outcomes

There is still much to be done to create an effective medical mutual aid system in Region III. Progress has been made, however as OADMHC's have begun to be formally appointed and regional elements continue to meet regularly to continue the planning process. Working relationships between counties, the region and the state have grown stronger and, generally, a better understanding of the medical mutual aid system has developed. Formal agreements with operational areas have not yet been established, but the review process continues.

Conclusion

Most areas of this project are evolving in a positive manner. More operational area elements are participating with regional personnel and have helped move the region closer to an organized system.

The effort expended to meet the project's objectives far exceed the level of support from the Block Grant. This is due to the logistics of working with and coordinating efforts among the area's thirteen counties. The number of political entities and the vast geography covered by the project, in excess of 20% of the state's geography, are the primary factors creating this excess workload.

Developing/Enhancing Rural EMS Reimbursement

Grantee:
Northern California EMS Agency
Project Number: EMS-6017
Project Period: 07/01/96-06/30/97
Project Amount: $27,258.00

EMS Administrator:
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Introduction

This project sought to expand on a previous effort to provide options to rural EMS providers in the establishment and continuation of effective reimbursement programs. A common observation in rural EMS is that many ambulance and fire rescue services, primarily volunteer and public organizations, are reluctant to pursue or even consider billing for services and pursuing reimbursement for the costs of EMS response. While many rural services suffer severe financial hardship, this practical and readily available source of revenue is too often ignored.

Project Description

Project staff made presentations to EMS providers to improve their awareness of reimbursement issues, developed a manual on the subject, and offered billing services directly.

Tasks/Methodology

Project personnel performed billing functions on behalf of EMS providers, using an ambulance billing program for PC. Providers paid 6% of the revenues recovered by the LEMSA for the service. Rate structures and billing practices were evaluated, and recommendations made to improve them. Presentations were made which included narrative presentation, distribution of written materials, and demonstration of the billing software on a portable computer. Questions to the agency on related issues were answered, and supporting documentation distributed, including information on 1996's Proposition 218 and its impact.

Outcome

Between September, 1996 and June 1997, two ambulance services and one fire department contracted with the LEMSA to perform billing for them, with significant reductions in their workloads and improvements in recovery and revenues. 188 calls were billed for a total of $118,527.50, yielding a 54.7% collection rate. The project grossed revenue totaling $2,610.30 for the LEMSA, with net revenue of $1,467.65. Interest in and awareness of reimbursement issues has improved considerably. While there was very little interest expressed in late 1995, by the end of this project 25.4% of fire and ambulance providers had requested copies of the Rural EMS Reimbursement Manual. Many public providers were unaware that fees for service are allowed under California law, and almost none knew the requirements for having these fees legally and properly promulgated. Many had false impressions about the results of establishing fees.

Conclusion

Inadequate funding is likely to remain a major issue in California's rural EMS

community for the foreseeable future. Those LEMSAs serving rural areas can offer significant benefits to providers by providing leadership and education in billing and reimbursement issues. While a vast majority of Californians have insurance to pay for services related to medical emergencies and traffic accidents, most rural public and volunteer EMS providers make little or no attempt to capture these revenues. This source of funding can offer improved quality of service and stability in rural California's EMS systems, including those hurt by Proposition 218. EMS billing can provide a practical, stable, and effective source of revenue which can also be popular with the public.

Prevention, Injury Control, and Public Information & Education

Grantee:
Northern California EMS Agency
Project Number: EMS-6018
Project Period: 07/01/96-06/30/97
Project Amount: $42,317.00

EMS Administrator:
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Redding, CA 96002
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Introduction

The 1992 Emergency Preparedness and Injury Control (EPIC) Program reflected pediatric injuries in our region in need of prevention. Specifically, we saw that pediatric mortality rates and unintentional injuries were the highest in the state. Pediatric suicide rates were the second highest in the state and were increasing. Motor vehicle vs. pedestrian incidents had increased and homicide rates, though lower than urban areas, had increased. Two injury prevention programs were present in our region on a limited basis and needed assistance to expand.

Project Description

The Injury Prevention/Public Information project sought to assess, coordinate, evaluate and implement additional injury prevention programs in our region for the benefit of those most at risk, the young and the elderly. Utilizing a multiple agency Prevention Task Force, we planned to coordinate injury prevention training currently occurring in our region and facilitate training for those areas/schools most in need. We also planned to coordinate these activities with the EMSC Task Force. Our plan included an EMS newsletter, incorporating NHTSA educational injury prevention materials and EMS information for our consumers.

Tasks/Methodology

An Injury Prevention Task Force was assembled and a mission statement developed. Contact with the EMSC Task Force was maintained by the Project Coordinator. Despite limited participation from outside the Redding area, the Project Coordinator disseminated information and received feedback from the region's prehospital liaison nurses at their quarterly meetings.

Think First for Kids was implemented in Orland, Paradise, Durham and Gridley, with the expertise of the Chico Think First for Kids Coordinator. In addition, the Chico Unified School District unanimously voted to implement Think First for Kids in all of their elementary schools. A Think First for Kids chapter is being developed in the Redding area to facilitate implementation of Think First for Kids in the northern region.

ENCARE supplies were purchased at the direction of the local ENCARE director. Alcohol/drug awareness education was presented to local high schools in addition to five in the remote areas of our region.

The Injury Prevention Task Force was concerned that a mass mailing to most of our region's households with injury prevention/EMS information would be considered just another piece of junk mail. Implementing a newsletter to EMS providers that incorporated injury prevention material to

assist providers with delivery of injury prevention in their communities was preferred. The television medium was the preferred method of injury prevention delivery by the Task Force. Two themes were chosen based on North and South Zone trauma data. Jet ski safety and diving safety were featured separately in one minute segments. Both Level II Trauma Centers, in partnership with the Task Force, participated in the production and air time purchase of the videos. Through negotiation the local cable/TV stations agreed to donate a like amount of air time.

Outcomes

Water safety information was incorporated into Nor-Cal EMS's newsletter in May, coinciding with Trauma Awareness month. An expanded version of the water safety information was shared with prehospital liaison nurses, Shasta and Butte County Injury Prevention Coalitions, and the EMSC Task Force. Water safety brochures designed for children were purchased and donated to a local Grassroots for Kids safety fair. The two video spots covering jet ski and diving safety ran from the week before Memorial Day to the week after Labor Day, airing mostly during prime time. We had many positive responses to the videos, including a state park from southern California, who requested the jet ski video to show at their park.

Think First for Kids are continuing to expand into Shasta and Tehama counties. A Think First for Kids chapter is continuing to evolve in Redding. ENCARE continues their mission of drug and alcohol awareness in teens. Different agencies became aware of available programs in their area through the efforts of the Injury Prevention Task Force.

Conclusion

In conclusion, awareness of different programs in their area enhanced the networking of different agencies who previously had not worked together. The Injury Prevention Coalitions in Shasta and Butte counties had more exposure to EMS. Reaching the remote areas of our region was accomplished through the prehospital liaison nurses. EMS providers injury prevention knowledge was increased through the newsletter and their prehospital liaison nurses. The Project Coordinator remains involved with the Shasta County Injury Prevention Coalition, providing statistics, resources and information as needed reflecting EMS.

Foundation - EMS Alternative Funding Sources

Grantee:
Northern California EMS Agency
Project Number: EMS-6023
Project Period: 06/01/96-12/31/97
Project Amount: $165,000.00

EMS Administrator:
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Introduction

Continued funding for EMS agencies through State General Funds or Federal Block Grants administered by the state has been a concern for some time. In addition, local governmental funding remains, in most cases, problematical. Unless appropriate steps are taken to secure alternative sources of funding, EMS in general, and we as local agencies particularly, will be put in serious jeopardy with the diminution in patient care the likely result. In looking for ways to ensure long term financial stability of the EMS system the development of charitable foundations for local agencies showed promise as part of the solution to the funding problem.

Project Description

This project set out to provide an analysis of legal and accounting requirements for charitable foundations and the development of legal, accounting and foundation operation templates for use by each of the EMS agencies in the state. It also sought to provide public information and marketing tools, generic in nature, that would allow any State EMS agency to use them for education and fund-raising purposes. The project, in addition, sought to provide a summary of other alternative sources of funding for other local EMS agencies. An integral part of the project was the ability of NorCal EMS to establish a foundation.

Tasks/Methodology

Objectives:

1. To execute all contractual obligations with the State of California Emergency Medical Services Authority.

2. To review and evaluate the legal, accounting, daily operation and computer requirements for establishing and running a successful foundation.

3. To develop templates for the formation and management of a foundation.

4. To acquire and implement the hardware and software components necessary to run a foundation.

5. To legally form and begin operations of the foundation.

6. To analyze other alternative sources of funding.

These objectives were met largely by the development of a team composed of the Chief Executive Officer, Associate Executive Officer of Nor-Cal EMS, together with Nor-Cal EMS Office Manager and appropriate consultants to guide us through the development of templates for all of the EMS agencies and the development of a foundation for Nor-Cal EMS. Constant communication

among those participating and frequent goal oriented meetings allowed us to avoid unnecessary duplication of effort and to produce a product in a timely manner.

Outcomes

This project provided each Local EMS Agency with a manual to guide them through the process of the formation of a foundation from a legal, accounting and operational perspective. It, in addition, provided marketing tools in the form of three newspaper ads, two videos (one divided into two parts), a self running slide show and a radio announcement. Another product outcome was a funding resource's manual, outlining other potential sources of revenue for Local EMS Agencies. These products should provide a Local EMS Agency with a running start in establishing their own foundation. In addition, it provides the public information and marketing tools to allow such an organization to communicate its message. In the alternative, a Local EMS Agency could simply use the public information and marketing products provided. Nor-Cal EMS has established its foundation and has secured funding for the first three years of operation. We do believe it will take five years of sustained effort to see the generation of stable, secure revenue.

Conclusion

The various products supplied in the package of materials given or mailed to each Local EMS Agency should provide benefits to each such agency desiring to establish supplemental sources of charitable income. We believe, that properly used, the concept of foundations and the development of a charitable giving base can provide substantial long term benefits to any local agency and can also provide such benefits to a statewide foundation.

Data Conference

Grantee:
North Coast EMS Agency
Project Number: EMS-5043
Project Period: 06/30/96-06/30/97
Project Amount: $20,000.00

EMS Administrator:
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Introduction

Few areas of country have successfully utilized data to determine public policy or evaluate the EMS system. The paucity of analytical information is particularly problematic as we approach managed care issues and increasingly turn to the courtroom for conflict resolution. In California, the EMS Systems Act requires that planning guidelines address "data collection and evaluation," and the legislature created the local EMS agency to "evaluate" the EMS system. The *EMS System Standards and Guidelines*, June 1993, specifies that the "local EMS system should have mechanisms to collect data regarding operational and clinical aspects of the system, covering all stages of the system. Both day-to-day quality assurance/quality improvement audits and overall evaluations of system operations are necessary". Recommended standards include: evaluation of the response to, and the care provided to, specific patients; linkage of prehospital, dispatch, emergency department, in-patient and discharge records; establishment of an integrated data management system which includes system response and clinical data; and use of patient registries, tracer studies, and other monitoring systems to evaluate patient care at all stages of the system. Specific EMS system evaluation standards, however, have largely been left up to each agency to delineate. Special project funding was requested to organize a statewide, multi-disciplinary data conference designed to improve data utilization in EMS.

Project Description

Between June 30, 1996 and August 31, 1997, North Coast EMS, in partnership with the Emergency Medical Services Administrators Association of California, received California EMS Authority Prevention 2000 Block Grant support to undertake a joint endeavor to coordinate and conduct, in conjunction with the 1997 annual EMSAAC conference, a statewide data conference on report generation and quality indicators. Two consecutive special project contracts funded a single conference. The purpose of the conference was to provide EMS administrators, data managers, physicians, nurses, paramedics, EMTs and others with the opportunity to collectively participate in a statewide meeting designed to enhance the value of computer-generated data reports. Conference focus was on current state and national data utilization and statistical and research methodologies designed to evaluate the EMS system, investigate the efficacy of prehospital procedures, enhance quality improvement efforts and facilitate development of an improved statewide database.

Tasks/Methodology

The North Coast EMS Executive Director and EMSAAC Data Subcommittee, which was previously established to help standardize EMS data applications throughout the State, instituted a Data Conference Task

Force for collaboration on all decisions involving conference coordination and location selection, speaker selection and approval, and program content. The Task Force and the EMSAAC President-elect decided to combine the data conference with the annual EMSAAC conference. The EMSAAC Conference Subcommittee was subsequently formed to oversee the conference. The group elected to subcontract with "Concepts Meeting and Trade Show Management" from San Diego for site selection, promotion, registration and on-site coordination. Conference Co-Coordinators (Barbara Pletz and Larry Karsteadt) then widely distributed a survey instrument to solicit input on conference ideas, current data applications and possible speakers. Recommendations for conference design were summarized and San Diego was selected as the site. The Subcommittee decided to have a mixture of full and half-day sessions with two primary tracks: data and managed care. The Data Track included the National Highway Traffic Safety Administration's (NHTSA) EMS Information System, the Status Report of California EMS Data Programs, and EMS Vendor/Provider Workshop, a Statistical Thinking Workshop and several EMS Data Innovation presentations from throughout California. A Friday afternoon session was also planned to help formulate recommendations for local and statewide EMS data system improvement. The conference officially entitled *Shaping EMS for the 21st Century: Data, Research, and a Changing Marketplace,* was scheduled at the Princess Resort in San Diego between May 28 through May 30, 1997. A brochure and syllabus/conference guide were developed and distributed.

Outcomes

The conference was successfully completed and attended by over 200 people. Approximately 30 individuals also attended the open discussion at the end of the conference. Conference participants included EMS administrators, EMS data management coordinators, medical directors, nurses, paramedics and many others. Conference evaluations were "very good" to "excellent".

Conclusion

The San Diego Conference provided an excellent opportunity for participants to review current state and national data applications relevant to the EMS decision making process. Importantly, the NHTSA presentation on the EMS Information System and projected quality improvement standards was the first in the United States. The Statistical Thinking workshop provided an entertaining and invaluable overview of the application of statistics to EMS. State and local presentations on data innovations demonstrated that numerous projects are underway in California that will enhance our utilization of data and research methodologies. The fact that over thirty participants attended the recommendation session speaks highly of the collective interest in improving the usefulness of data management systems in California.

Emergency Medical Services For Children (EMSC)

Grantee:
North Coast EMS Agency
Project Number: EMS-5044
Project Period: 06/30/96-06/30/97
Project Amount: $64,000.00

EMS Administrator:
Larry Karsteadt
86 E Street
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(707) 445-2081

Introduction

The North Coast EMS (NCEMS) region includes Humboldt, Lake, Del Norte, and southern Trinity counties in California. These primarily rural counties have a population of 215,000 living in an area of 6,000 square miles. Eight hospitals serve the area with six being previously recognized as Emergency Department approved for Pediatrics (EDAP) facilities. No PICU or PCCU capability exists in the region. The purpose of this project was to develop and implement a comprehensive Emergency Medical Services System for Children in the region through the accomplishment of eight specific multifaceted objectives. The Northern California Safety Consortium (NCSC) was contracted as the consultant to NCEMS for this project.

Project Description

A centralized EMSC program was established as part of the EMS system to ensure quality emergency medical care for all children. This project was conducted between October 1, 1996 and June *25*, 1997, and second year funding has been secured to fully implement the program.

Objectives

Existing social and medical services for children were assessed and incorporated in referral pathways that will be made available to prehospital personnel. Prevention strategies using EMS personnel were evaluated and presented. Existing policies and procedures and equipment lists were modified to reflect recommendations of the California EMS Authority's *EMSC Final Report* and current American Heart Association guidelines. Pediatric training equipment was purchased. An Annual Skills Refresher Day program was developed to ensure EMS personnel are proficient in seldom used skills. EDAP standards were modified and two new applications for EDAP were received and site visits were scheduled. A Pediatric Liaison Nurse handbook was developed as an orientation tool for EDAP personnel. Pediatric transfer guidelines were reviewed. Post incident recovery and CISD programs were evaluated and additional personnel were trained. Pediatric components to the computerized prehospital data base program were reviewed for inclusion of pediatric CQI parameters and the pediatric components of the EMS plan were addressed.

Tasks/Methodology

Objectives of the project were accomplished by the NCSC team through extensive use of surveys and questionnaires distributed to EMSC task force members. Medical Advisory Committees in Humboldt and Lake County were utilized to evaluate policy and procedure changes. Drafts of all products were broadly circulated for comments.

Outcomes

New policies, procedures and equipment lists have been distributed for public comment. New EDAP Standards and a Pediatric Liaison Nurse handbook are available in both print and Word 6 electronic media formats. A CISM class has been scheduled for September. The Annual Skills Refresher materials are available in draft. It is anticipated that all draft documents will be finalized by October, 1997.

Conclusion

The NCEMS region will soon have a comprehensive EMSC program in place. Prehospital personnel will have readily available resources for children's service referrals, current protocols, an understanding of their role in injury prevention, and a comprehensive continuing education program in place to ensure competency in seldom used skills. By the conclusion of the second year funding a community based post recovery team will be in place, pediatric transfer agreements will be established, and all eight hospitals in the region will be EDAP facilities.

Data Conference Supplement

Grantee:
North Coast EMS Agency
Project Number: EMS-6036
Project Period: 09/01/96-08/31/97
Project Amount: $5,000.00

EMS Administrator:
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Eureka, CA 95501
(707) 445-2081

Introduction

Few areas of country have successfully utilized data to determine public policy or evaluate the EMS system. The paucity of analytical information is particularly problematic as we approach managed care issues and increasingly turn to the courtroom for conflict resolution. In California, the EMS Systems Act requires that planning guidelines address "data collection and evaluation," and the legislature created the local EMS agency to "evaluate" the EMS system. The *EMS System Standards and Guidelines*, June 1993, specifies that the "local EMS system should have mechanisms to collect data regarding operational and clinical aspects of the system, covering all stages of the system. Both day-to-day quality assurance/quality improvement audits and overall evaluations of system operations are necessary". Recommended standards include: evaluation of the response to, and the care provided to, specific patients; linkage of prehospital, dispatch, emergency department, in-patient and discharge records; establishment of an integrated data management system which includes system response and clinical data; and use of patient registries, tracer studies, and other monitoring systems to evaluate patient care at all stages of the system. Specific EMS system evaluation standards, however, have largely been left up to each agency to delineate. Special project funding was requested to organize a statewide, multi-disciplinary data conference designed to improve data utilization in EMS.

Project Description

Between June 30, 1996 and August 31, 1997, North Coast EMS, in partnership with the Emergency Medical Services Administrators Association of California, received California EMS Authority Prevention 2000 Block Grant support to undertake a joint endeavor to coordinate and conduct, in conjunction with the 1997 annual EMSAAC conference, a statewide data conference on report generation and quality indicators. Two consecutive special project contracts funded a single conference. The purpose of the conference was to provide EMS administrators, data managers, physicians, nurses, paramedics, EMTs and others with the opportunity to collectively participate in a statewide meeting designed to enhance the value of computer-generated data reports. Conference focus was on current state and national data utilization and statistical and research methodologies designed to evaluate the EMS system, investigate the efficacy of prehospital procedures, enhance quality improvement efforts and facilitate development of an improved statewide database.

Tasks/Methodology

The North Coast EMS Executive Director and EMSAAC Data Subcommittee, which was previously established to help standardize EMS data applications throughout the State, instituted a Data Conference Task

Force for collaboration on all decisions involving conference coordination and location selection, speaker selection and approval, and program content. The Task Force and the EMSAAC President-elect decided to combine the data conference with the annual EMSAAC conference. The EMSAAC Conference Subcommittee was subsequently formed to oversee the conference. The group elected to subcontract with "Concepts Meeting and Trade Show Management" from San Diego for site selection, promotion, registration and on-site coordination. Conference Co-Coordinators (Barbara Pletz and Larry Karsteadt) then widely distributed a survey instrument to solicit input on conference ideas, current data applications and possible speakers. Recommendations for conference design were summarized and San Diego was selected as the site. The Subcommittee decided to have a mixture of full and half-day sessions with two primary tracks: data and managed care. The Data Track included the National Highway Traffic Safety Administration's (NHTSA) EMS Information System, the Status Report of California EMS Data Programs, and EMS Vendor/Provider Workshop, a Statistical Thinking Workshop and several EMS Data Innovation presentations from throughout California. A Friday afternoon session was also planned to help formulate recommendations for local and statewide EMS data system improvement. The conference officially entitled *Shaping EMS for the 21st Century: Data, Research, and a Changing Marketplace,* was scheduled at the Princess Resort in San Diego between May 28 through May 30, 1997. A brochure and syllabus/conference guide were developed and distributed.

Outcomes

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Conclusion

The San Diego Conference provided an excellent opportunity for participants to review current state and national data applications relevant to the EMS decision making process. Importantly, the NHTSA presentation on the EMS Information System and projected quality improvement standards was the first in the United States. The Statistical Thinking workshop provided an entertaining and invaluable overview of the application of statistics to EMS. State and local presentations on data innovations demonstrated that numerous projects are underway in California that will enhance our utilization of data and research methodologies. The fact that over thirty participants attended the recommendation session speaks highly of the collective interest in improving the usefulness of data management systems in California.

Emergency Medical Services For Children (EMSC)

Grantee:
Riverside County EMS Agency
Project Number: EMS-5045
Project Period: 06/30/96-12/31/97
Project Amount: $55,000.00

EMS Administrator:
Michael Osur
P.O. Box 7600
Riverside, CA 92513-7600
(909) 358-5029

Introduction

In 1995 the Riverside County EMS Agency (RCEMSA) received first year grant funding to plan, develop and integrate an Emergency Medical Services for Children (EMSC) subsystem into its existing EMS system. The first year's energies focused on developing pediatric specific guidelines for Emergency Departments and the prehospital care component. In 1996 the RCEMSA obtained second year grant funds to continue the development and implementation of the EMSC project.

Project Description

The purpose of the second year of the grant was to develop guidelines that addressed the facilities and services needed to meet the emergency and critical care needs of children, especially those requiring tertiary care. This was crucial to Riverside County as there are no Pediatric Critical Care Centers (PCCC) located within its borders. The second year activities included the final approval and adoption of appropriate pediatric equipment and supplies, field treatment protocols, training and education for prehospital care providers.

Several major objectives were identified to accomplish the project goals: (1) the continuation of the established advisory committee and task force, (2) further development of and implementation of pediatric prehospital services, (3) development of a set of comprehensive guidelines which addressed inter-facility pediatric tertiary care consultation and/or transfer, transport programs and PCCCs, (4) on-going identification of real or potential barriers and (5) cost data collection.

Tasks/Methodology

The Advisory Committee and two remaining Task Forces (Prehospital Care and Inter-facility Consultation and/or Transfer) remained active. The Task Forces completed assigned objectives early in the second grant year and disbanded. All remaining tasks were accomplished by the Advisory Committee. Again, the California State EMSC Final Report was utilized as the primary reference for all guideline development. In addition, Dr. Ann Pettigrew, of the Pediatric Intensive Care Network, provided on-going guidance and resource materials.

The Agency continued conducting Emergency Department (ED) Consultation Visits. By September 1997, all 15 of Riverside County receiving EDs had participated in a Consultation Visit.

Outcome

Several documents were finalized and approved for implementation county-wide; Guidelines for Pediatric Inter-facility Transport Programs, Guidelines for Pediatric Critical Care Centers, Pediatric Critical Care Center

Survey Tool, Pediatric Inter-facility Transport Programs Survey Tool, and Pediatric Tertiary Care Consultation and/or Transfer Criteria poster/tool. In addition, the revised BLS/ALS equipment and supply lists and pediatric field treatment protocols were adopted into the Riverside County EMS Agency Policies, Procedures and Protocols manual. County-wide training was conducted to all prehospital care personnel including MICNs on the revised manual. The Agency is continuing its endeavor to develop a comprehensive Prehospital Pediatric Training Program (P3) curriculum.

Finally, two regional PCCCs, Children's Hospital of Orange County and Loma Linda University Medical Center/Children's Hospital participated in survey visits. Both of the facilities passed the stringent survey receiving only minor recommendations and are now recognized and approved by the Agency as PCCCs for Riverside County.

Results from the first year's labor are being realized. Several hospitals which received ED Consultation Visits during the first year have upgraded their services according to the evaluation recommendations.

Conclusion

The EMS Agency continued to implement subsystem components which will enhance the quality and level of care provided the critically ill and injured children in Riverside County. Though EMSC grant funding has ended, the Agency has demonstrated its commitment to children in a variety of avenues including; continuation of the EMSC Advisory Committee, expanding its pediatric injury prevention component by adding projects addressing the teenage impaired driver and violence prevention, actively participating on the county-wide, multi-disciplinary Child Death Review Team and addressing pediatric needs in the county-wide EMS Agency committees.

Most importantly, the efforts of the past two years have firmly established strong relationships and linkages between the various providers that are crucial in the care of the critically ill and injured child. This EMS Agency looks forward to future innovations and advances which will further improve its services to children in Riverside County.

First Responder to EMT Bridge

Grantee:
Riverside County EMS Agency
Project Number: EMS-5046
Project Period: 06/30/96-10/31/97
Project Amount: $40,000.00

EMS Administrator:
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(909) 358-5029

Introduction

In July 1995 Riverside County Emergency Medical Services Agency received a grant to research, develop, and implement a Bridge Program transitioning from California Department of Forestry First Responder status to Emergency Medical Technician certification. Riverside County is the second largest county in the state in area, extending nearly 200 miles east to west and encompasses over 7,000 square miles. The majority of this area is wilderness and rural. While there are several population centers interspersed throughout the county, most of these urban areas are serviced by municipal fire departments. It is the responsibility of Riverside County Fire/California Department of Forestry (RCF/CDF) to respond to medical emergencies in the unincorporated and remote areas, providing the primary medical response unit for these districts.

Project Description

The first part of the grant was spent determining program content differences, studying other Bridge-type programs, and developing a curriculum for the Bridge program. The second year of the grant compared and contrasted each of the student populations, measured effectiveness and feasibility of the curriculum, and retention factors were evaluated. Traditionally trained EMT's and Bridge students were compared on theory content and skills application. Retention factors were identified and assessed. Specific time intervals were identified and evaluations were implemented at those times. Statistical analysis was performed on the data collected and interpreted.

Tasks/Methodology

The evaluation components of the process consisted of both theory and skills measures. Initial didactic and practical examinations, part of the first year grant comparison were analyzed and compared between bridge classes and the control group of traditionally trained EMT's. At designated time intervals, 8 and 11 months, the initially tested population were given theory and skills evaluations. Additional information was collected relating to employment, frequency of EMT skills application, and demographic data.

Outcomes

The outcomes of the evaluation showed that the knowledge acquired at the First Responder level was integrated and retained; the knowledge and skills acquired in both the Bridge and Traditional EMT courses was retained, and at the intervals tested the scores were either consistent or were higher for both groups. An additional finding was the indication that the Bridge Program students scored higher in the theory component than the traditionally trained EMT students.

Conclusion

In summary, the overall success of the Bridge program can be measured by several factors: An appropriate curriculum was developed that was feasible and cost effective to implement, and student evaluation forms showed a favorable response to the curriculum, scheduling and program format. The evaluation of differing student populations showed that previously learned knowledge and skills can be successfully applied in future education and training programs for the advancement of practitioners. RCF/CDF trained First Responders can successfully compete EMT-1 training in 64 hours rather than the full 120 hour program.

EMS Data System

Grantee:
Riverside County EMS Agency
Project Number: EMS-5047
Project Period: 06/30/96-10/31/97
Project Amount: $80,000.00

EMS Administrator:
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Introduction

Currently the local EMS agency is unable to obtain Patient Care information in a timely manner. ALS providers use handwritten Patient Care Reports to log patient call information making it a tedious and time consuming effort to perform QA or QI, putting a tremendous strain on the hospitals and the local EMS agency. This also prevents obtaining statistical information for reporting to the EMSA which is much needed for Legislature.

Project Description

To work with ALS and Hospital providers to provide a computerized system for Patient Care recording. To coordinate a central work area for the Paramedics to input the information. To train the Paramedics and Providers on the use of the system. To setup a central server for downloading the information obtained from the Patient Care Reports for report generation to meet the data set of the State of California.

Tasks/Methodology

1. Develop a standardized patient care record (PCR) for use by all EMS providers.

2. In coordinating the efforts of the task force to develop a standard form, changes were made to the system based on information obtained from the pilot participants. Modifications and additions were added by Healthware Solutions.

3. Training of field personnel in the use of the system was held using one of Riverside County's training centers offering all trainees hands on computer training of the system. Both Administration classes and Patient Care Reporting, Train the Trainer classes were held to accommodate the providers. Field training was also done offering hands on computer training to ALS providers on site.

4. Install the data program at select sites and monitor the use of the forms and data program.

5. Information from the pilot were compiled and the information from the pilot project were coordinated with Healthware Solutions to make program modifications. Many of the modifications were added to create PCR97.

6. An implementation outline for program start was generated by the Data Task Force participants and agreed upon for June 1, 1997.

7. Installation of the EMS Database program (EMSDB) at the provider and

EMS Agency levels was done on a as needed basis. Many of the providers did not have a computer system to install the PCR97 program and obtained one or upgraded a system for installation.

Outcomes

From the pilot program, the EMS agency obtained useful information from the users of the system to identify key areas for improving the computerized Patient Care Reporting system. These changes were made and incorporated into the system to enable more sufficient patient care reporting. With these changes a more defined report generation was built to accommodate the providers and the EMS agency.

Conclusion

The project as a whole was met with major opposition from the management of several ALS providers and was put on hold to try and accommodate their needs. The ALS providers who were in support of the system made it mandatory for their Paramedics to use the system and the EMS agency has provided support and training to make the transition as easy as possible.

Pediatric Injury Prevention

Grantee:
Riverside County EMS Agency
Project Number: EMS-5048
Project Period: 06/30/96-10/31/97
Project Amount: $45,000.00

EMS Administrator:
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Introduction

Injuries are the leading cause of morbidity and mortality for children and young adults in the United States. In California during the period from 1985-1994, intentional injuries rose 69 percent because of a rapid increase in homicide. In contrast, unintentional injuries (e.g. drowning) declined 24 percent (EPIC Proportions, October 1997). Violence and abusive behavior have been designated as a priority for health promotion and disease prevention by the U.S. Department of Health and Human Services. Riverside County, like most urban areas, has recognized the need to focus efforts in violence prevention programs.

No single intervention can produce a large and uniform reduction in injury. Injury research has determined that to be successful, program intervention must be multi-faceted; that is, they must focus on more than just a single intervention.

Project Description

In 1995, Riverside County EMS Agency visualized an opportunity to reduce the number and severity of childhood injuries through the development of a comprehensive pediatric injury prevention program. EMS was successful in the development and implementation of an Emergency Medical Services for Children (EMSC) subsystem within its EMS system. In addition, as part of the education component of the program, two safety programs; Walking Safe and Project S.A.F.E. were developed and conducted in Riverside County schools. Both programs offered an opportunity for children at various developmental stages to experience multiple positive role models as they received vital safety information. By using these positive role models, we were able to incorporate methods of behavior modification while simultaneously increasing public awareness on ways to reduce injuries.

Both school programs received positive evaluations from teachers, program instructors, students and parents. In addition, the schools have incorporated these programs into their academic year as student activities.

In 1996/97, EMS Agency obtained funding to continue providing injury prevention programs to Riverside County residents. Two additional programs were developed and implemented in the community.

Tasks/Methodology

The purpose of the project was to: (1) implement Accidents Aren't; a program designed for prehospital care personnel to introduce them to the concepts of injury control (2) to conduct Hands Are Not For Hitting program and (3) to implement the C.H.O.I.C.E.S. program, a violence prevention program designed for middle school and high school students.

The Accident's Aren't, Module I, II, and III curriculum was taught in September to Prehospital and hospital staff educators. Based upon a review of the class evaluations we found that the program in the current format at this time was not well accepted for various reasons. The final decision was to not incorporate the Accidents Aren't curriculum into the existing ALS provider curriculum.

Several "Hands Are Not For Hitting" campaigns were conducted to schools and at safety fairs. The response was very favorable. In fact, we had more requests than we were able to accommodate at this time. However, the Program Coordinator is working closely with school principals and health fair coordinators to continue to incorporate this program into their activities or events.

The C.H.O.I.C.E.S. program was also well received by school teachers and principals in Lake Elsinore. The consultant modified the original curriculum to target a younger audience. The consultant contacted and conducted instructor training on the violence prevention curriculum. Participation on curriculum modification was obtained by participating teachers. After several meetings and discussion a final draft was approved. Teachers have begun incorporating the curriculum into the academic year program.

Conclusion

Riverside County EMS Agency was successful in the implementation of new and innovative injury prevention programs. The Agency is obtaining positive recognition from the community for their success in program implementation. Further work needs to be implemented regarding measuring the true effectiveness of these programs.

EMS Data System Equipment

Grantee:
Riverside County EMS Agency
Project Number: EMS-6037
Project Period: 09/01/96-01/31/98
Project Amount: $86,779.00

EMS Administrator:
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Introduction

Prior to event initiation the local EMS agency is unable to obtain Patient Care information in a timely manner. ALS providers use handwritten Patient Care Reports to log patient call information making it a tedious and time consuming effort to perform QA or QI, putting a tremendous strain on the hospitals and the local EMS agency. The other problem is Riverside County providers are not willing to pay for hardware to obtain Patient Care Reports. However, if the county wants to obtain the information the providers agreed to help with a portion of the funding.

Project Description

1. To work with ALS and Hospital providers to provide an area within the Emergency room of each hospital in Riverside County including Loma Linda University Hospital and Redlands Community which service Riverside County also.

2. To install the computers and printers in a central work area for the Paramedics to input the information.

3. To setup the computers for modem transfer of data to the County Computer Network Server.

Tasks/Methodology

1. Work with county hospitals to coordinate a central area within the Emergency Room for the designated number or computers for the PCR97 program.

2. Work with hospital providers to setup a schedule for installation of the computers.

3. Notify ALS Providers as to the location of the system for use of the PCR97 program.

4. Coordinate with the Data Task Force a start date for use of the system.

5. Work with ALS Providers to ensure the proper equipment is purchased that is needed for their location to input non transport information.

Outcomes

From the pilot program, the EMS agency obtained complaints about the length of time needed to complete the computerized PCR. Re-training was done to add tips and shortcuts for inputting the PCR. Tips and shortcuts for decreasing input time included not using the mouse, but instead using the "Tab" key and the "Enter" key. This moves you through the program much faster than

taking your hands off the keyboard and using the mouse. Many of the Paramedics are experiencing less input time after re-training.

Conclusion

The project took longer than expected due to purchasing procedures. Installations went smoothly and each hospital was accommodating in providing space and necessary resources for the system. Gaining buy-in from field providers was difficult. Some systems were sabotaged so severely the systems were replaced and the hard drives had to be restored.

Currently AMR is evaluating pen-based computers and a pilot will be conducted for the next six - eight weeks. The Fujitsu pen-based computer and the Husky pen-based computers will be piloted for field and program performance. Six (6) of the County's eight (8) providers are using the Data System. However, full implementation must await conclusion of the pen-based pilot program.

Bicycle Helmet Education

Grantee:
Riverside County EMS Agency
Project Number: EMS-6038
Project Period: 09/01/96-01/31/98
Project Amount: $41,600.00

EMS Administrator:
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Introduction

The bicycle helmet program was developed in response to a growing need to educate children about the safety issues surrounding bicycle and traffic safety. Head injury is the most common cause of death and serious disability in bicycle crashes. Head injuries account for 62 percent of bicycle-related deaths, for 33 percent of bicycle-related ED visits, and for 67 percent of bicycle related hospital admissions according to a report on Bicycle helmet laws and educational campaigns: an evaluation of strategies to increase children's helmet use of the American Journal of Public Health, 1993.

Another study conducted by Children's Safety Network and the National Center for Education in Maternal and Child Health in 1994 found that laws requiring helmet use, combined with education and public awareness programs, appear to result in a dramatic increase in helmet use among children. Most injuries occur from lack of knowledge, or from a lack of applying knowledge to change specific behavior.

Project Description

The Bicycle Helmet Education & Distribution program (BHEP) was designed to educate children and parents about bicycle and pedestrian safety and to provide low cost bicycle helmets to high risk children, thereby, reducing potential bicycle related injuries to children. While we know that bicycle helmets can reduce the risk of head injury by 85% we continue to see helmet non-use and misuse.

The BHEP program incorporated a bicycle/traffic safety education component in addition to the low cost helmet distribution. Twelve high risk elementary schools throughout Riverside County were targeted for the program.

To accomplish the program goals, a Program Coordinator was identified to assume overall responsibilities for program implementation. Meetings were established with appropriate school resource officers to identify target schools for program implementation. Meetings were held with school Assistant School Superintendents, Principles, Vice Principles and Teachers. In addition, presentations were conducted at various community meetings and coalitions as part of a community awareness and public relations campaign to obtain community support.

Tasks/Methodology

The education component consisted of either a classroom safety presentation, a bicycle rodeo or a BMX safety demonstration. The Program Coordinator contacted several education program resources, including SAFE MOVES, a traffic safety rodeo and Perfection

on Wheels, a BMX safety demonstration. Police Traffic Officers who work in bicycle safety programs throughout Riverside County were identified and asked to participate in the BHEP program. The Program Coordinator purchased approved bicycle helmets from Safe Tech/Troxel Bicycle Helmet distributors. Culturally and age appropriate education materials were developed and ordered from existing sources.

After the education was conducted, the entire school population had the opportunity to purchase approved bicycle helmets for $3.00. Bicycle helmet order forms were distributed to children through their classroom teachers. Teachers collected the order forms and the money. A designated individual in the school office tallied the helmets by size and then called the Program Coordinator with the total number of requested helmets. The Program Coordinator filled the school order and delivered the helmets to each school.

The funds generated from the low cost helmet purchase were deposited into the Bicycle Helmet Education & Distribution Program to purchase additional helmets. Additional helmets purchased were donated to local health & safety fairs, community organizations such as the Boy Scouts and at Car Seat Clinics/safety checkpoints.

Outcomes

The BHEP program was conducted in twelve elementary schools throughout Riverside County. Over 4,000 students received bicycle helmet education and 890 bicycle helmets were distributed to students in these schools. Bicycle helmets were also donated to safety/health fairs in Riverside County. The program was a great success in the schools. Positive evaluations were received from teachers, principles and participants.

Conclusion

As the word got out into the community, the Program Coordinator began to receive numerous requests for the program. We hope to continue the program, as funding allows. Partnerships have been established with police departments to expand bicycle helmet programs to as many elementary schools as we can reach.

Regional Disaster Medical Health Coordinator (RDMHC)

Grantee:
San Bernardino County EMS Agency
Project Number: EMS-5049
Project Period: 06/30/96-06/30/97
Project Amount: $80,000.00

EMS Administrator:
Diane Fisher
164 W. Hospitality Ln. Ste. 4A
San Bernardino, CA 92415
(909) 888-7511

Introduction

The intent of this project is to formalize, implement and continue to exercise activities which are appropriate to the continuation of programs previously developed by the Region VI Disaster Medical Health Coordination Committee. The project will support the State EMS Authority efforts to minimize the possibility of a disastrous situation.

Project Description

The project has several objectives and many tasks. The objectives can be grouped into three categories. They are:

1. Develop and maintain agreements among the six member counties for purposes of obtaining and organizing medical and health assistance. Develop and maintain agreements between Regions I and VI for purposes of resource acquisition and deployment.

2. Contact and coordinate with the other State Office of Emergency Services Region VI Coordinators such as for Law, Fire, Care and Shelter, Public Utilities and with Federal Emergency Management (FEMA) personnel for assistance in post disaster recovery.

3. Develop and maintain a region wide communications network for use by the Health Officers and their staff either during a disaster or for routine communications.

Tasks/Methodology

The assembly of Health Officers and disaster planners from the representative counties is the task of the RDMHC and its planners. A staff individual, which may also be the RDMHC Committee member, from each operational area is assigned to coordinate with the RDMHC. The method used to obtain working relationships is based upon understanding of the problem and training provided to those new to the planning principles of disaster prevention. Methods minimally include reliance upon legal obligations or direction. While there may be one or two key staff during the development of this project, it is intended that the framework or project be maintained through the interaction of the counties or operational areas.

Outcomes

During the fiscal year 1996-97 a disaster cooperative aid agreement between Region I and Region VI was completed, submitted for signatures, and approved by seven or eight of the eleven participating counties. A ground ambulance and EMS aircraft rate agreement was updated for use within Region VI. The issues surrounding cooperative use of Environmental Health

personnel was aired, allowing that profession to go forward with its aid arrangements. The Vector Control Districts which exist under the special districts umbrella are gathering signatures on a cooperative resource acquisition agreement.

Conclusions

This project intends to develop a medical and health community which is voluntarily compliant with the needs of its neighbors. This can be done through understanding of the needs, resource availability, and logistical problems encountered when sending resources into an austere environment. Preplanning is believed to be the most efficient option to provide care and maintain adequate resources throughout the remainder of the designated area.

Disaster Medical Assistance Team (DMAT)

Grantee:
San Bernardino County EMS Agency
Project Number: EMS-5050
Project Period: 06/30/96-06/30/97
Project Amount: $30,000.00

EMS Administrator:
Diane Fisher
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Introduction

Disaster Medical Assistance Teams (DMATs) consist of volunteer professionals organized into teams capable of sustaining 72 hours of medical care in austere environments. The management and care of the individual members was addressed during the lifetime of this grant. Specifics regarding the team standards for preparation, funding, relationships with employers and sponsors, and the interaction with government agencies were also addressed.

Project Description

The major objectives of this project are to provide a forum for Team Commanders, Executive Officers and sponsors to meet, identify and extract the individual and team needs for growth and stability. The second major project intent is to provide a manual containing the information identified by the Commanders as essential for good team health and to have that manual contain direction for new teams.

Tasks/Methodology

The facilitation of Commander's meetings was delegated to the California Specialized Training Institute CSTI as recommended by the EMS Authority. The division of tasks went along these lines: facilitation is CSTI, logistics is San Bernardino County EMS Agency, direction is through the Disaster Services Division of California EMS Authority, the focusing parties connecting the teams and the interested multi layered government parties are the DMAT Commanders.

Outcomes

1. The Commanders were able to compile directions from the State as to what and how they would like Medical assistance delivered when requested and during what conditions and times of a disaster.

2. The teams were able to express and compile concerns which have a debilitating effect upon the team functionality.

3. Needs were rated by importance and the potential to correct. For most of the needs a proposal on how to correct them was made.

4. A Policy and Operations Manual (POM) is being developed from this past year's work by the Commanders. Within the POM will be a Personnel Orientation Manual and a Performance, Operations and Methods Standards.

5. Recruitment procedures were reviewed in order to attract a higher percentage of retainable individuals.

Conclusions

Plans were identified to ferret out items which affect the performance and growth of the Disaster Medical Assistance Teams. Procedures were developed or existing plans were identified to address the items identified as affecting team performance. The prospects for DMATs as an important local State and Federal component which can replace vacant governmental medical assistance task forces are enhanced.

Primary Care in Rural EMS

Grantee:
San Bernardino County EMS Agency
Project Number: EMS-6039
Project Period: 09/01/96-08/31/98
Project Amount: $60,000.00

EMS Administrator:
Diane Fisher
164 W. Hospitality Ln. Ste. 4A
San Bernardino, CA 92415
(909) 888-7511

Project ends August 31, 1998. Final Report and Abstract Report will be due October 31, 1998.

Regional Disaster Medical Health Coordinator (RDMHC)

Grantee:
San Joaquin County EMS Agency
Project Number: EMS-5051
Project Period: 06/30/96-06/30/97
Project Amount: $40,000.00

EMS Administrator:
Darrell J. Cramphorn
P.O. Box 1020
Stockton, CA 95201
(209) 468-6818

Introduction

Seven years ago, San Joaquin County along with the other ten counties in OES Region IV chose to improve its multi-casualty (MCI) response system. There had been situations in the Region requiring mutual aid response, and several incidents occurring on border areas of the Region which highlighted the differences in MCI response by the prehospital personnel. Terminology, operational plans for response, and on-scene triage systems differed. These differences caused delays in care and disputes on scene regarding management and destination of the patients. It became clear to all that our responses would be enhanced if we would standardize our way of handling MCIs, disasters and medical mutual aid requests. The State funded this Project for three years, before converting the Region's efforts to a maintenance medical/health mutual aid grant, which San Joaquin County has received for the past several years.

Project Description

The basic goal of the Project has been to standardize the MCI and the medical/health mutual aid response for the counties in OES Region IV. The grant has been a great success. The necessary political support for change within the Region was and still is strong. The project was able to bring together EMS, OES, Fire and Law agencies within the Region and with the other Regional staff (e.g. fire/law). A MCI Plan was adopted, standardized training/curriculum were developed for all prehospital and hospital components, and key personnel/positions (e.g. OAMHCs, RDMHCs, Disaster Control Facilities) are designated. An MCI Plan that is approved by all counties is in place. For the past three years the State has funded a maintenance grant, which allows the Region IV counties to continue their coordinative work, update the MCI Plan, and continue training and testing of the response system.

Tasks/Methodologies

The core grant staff positions (Project Director and Project Manager) occupy permanent positions in the EMS and OES Agencies in San Joaquin County. Contract personnel were appointed to coordinate/manage the prehospital and hospital plans components. The same core staff has been used for the past seven years. In addition, the first years of the grant were spent in identifying the need to standardize within the region. The support was done through workshops held throughout the region. From this an Administrative Committee was appointed, with representatives from each county. The Administrative Committee and the project staff directed the activities of the project. Training needs, political strategies for implementation and project tasks were identified and issues were sorted out at this level. A lot of time was spent at the "grassroots" level to generate support and

commitment to this project.

Outcomes

After seven years of work, OES Region IV has an adopted MCI Plan, which also addresses medical/health mutual aid requests. A standardized curriculum is in place for prehospital and hospital training on the procedures. Instructors have been trained throughout the Region. All plans are consistent with SEMS. OADMHCs and an RDMHC have been designated in each county with alternates. Annual administrative meetings are held to update plans and identify needs. Several table top and mock drills are completed each year. The Regional Plan has been tested several times by actual disasters (floods of 1997, Oakland fires, etc) and has provided information to keep our Plan and operations alive.

Conclusion

OES Region IV counties have greatly improved their ability to respond to MCIs and medical/health mutual aid requests. The success of the project is directly tied to "grassroots" support, which came about because of the recognition of the benefits of standardization and because the objectives laid out were actually completed and delivered. Medical/Health management for disasters is difficult at best to do--and most do not agree on how it is best done. We found that the system of building a common base of support, adopting a plan, testing it, and revising it annually works. It is an approach that we feel should be used elsewhere in California.

Emergency Medical Services For Children (EMSC)

Grantee:
San Joaquin County EMS Agency
Project Number: EMS-6019
Project Period: 09/01/96-08/31/97
Project Amount: $65,000.00

EMS Administrator:
Darrell J. Cramphorn
P.O. Box 1020
Stockton, CA 95201
(209) 468-6818

Introduction

Beginning in late 1994 and continuing during 1995 the San Joaquin EMS Agency staff began to notice increasing numbers of pediatric patients within our EMS system. This corresponded to an increasing overall population within our county. Staff further noticed the need to improve care providers' awareness of the differences between pediatric and adult patients. Discussion with the Alpine, Mother-Lode EMS Agency and their implementation of an EMSC system as well as attendance at educational conferences with focus on EMSC prompted this agency to begin to implement a quality improvement plan.

Project Description

The purpose of the project was to assure the appropriate emergency and critical care services are available to meet the special needs of critically ill and injured children throughout a continuum of care from first detection of illness or injury to definitive care in specialized pediatric centers when this is needed.

The major objectives included the creation of an EMSC Advisory Committee with a broad base of care providers from within the county, the gathering and review of data related to pediatric emergency cases within our system as well as comparing information with other counties in the state, the developing of information gathering mechanisms including injury and illness prevention materials, and reviewing and revising guidelines for prehospital, emergency care, transfer, transport and critical care.

Tasks/Methodology

The advisory committee was formed and its members reviewed and revised prehospital, emergency department and inter-facility transfer guidelines in the first year. During year two, the committee reviewed transport and pediatric critical care center guidelines. The Agency finished consultation site visits for each hospital with the help of consultants. Additionally, the Agency distributed injury and illness materials to hospitals, clinics and schools.

Outcomes

The transport and pediatric critical care center guidelines are currently being presented to appropriate EMS committees for approval and adoption. Following that outcome, they will be printed and distributed. The hospitals visited during this year of the grant were well prepared and indicated the visit was a positive one. Injury and illness materials have been forwarded to health care providers as well as schools with special emphasis on drowning prevention. The committee has met less frequently during the second year of the grant, but those members who have missed remain interested and concerned with the committee's progress. Consequently, the Agency has met

little resistance to the guidelines. In addition, the hospitals have demonstrated commitment to transferring out pediatric patients quickly as need arises. Further, the hospitals are actively educating their staffs by offering classes especially PALS.

Conclusion

The second year of the EMSC grant was very successful. The project progressed rapidly, but effectively and with a broad base of community support. The EMS community continues to demonstrate great awareness of the special needs of pediatric patients and is doing much to train and improve itself beyond the guidelines established by committee.

Disaster Response Plan

Grantee:
San Mateo County EMS Agency
Project Number: EMS-5052
Project Period: 06/30/96-06/30/97
Project Amount: $70,000.00

EMS Administrator:
Barbara Pletz
225 West 37th Avenue
San Mateo, CA 94403
(650) 573-2564

Introduction

San Mateo County is located in an area at risk for a large scale disaster. Historically, the EMS Agency has assumed the lead role in disaster response for the Health Services Agency. This poses a problem for the EMS Agency which is familiar with EMS related response issues - not those of other health care disciplines. The current Public Health Annex to the County Disaster Plan has not been updated since 1988 (some portions even older), does not address broad public health/mental health issues, is not in an Incident Command System (ICS) format, and does not bring together all components of the Health Services Agency in a unified manner. A comprehensive and integrated County Health Care Disaster Plan that will utilize an ICS/Standardized Emergency Management System (SEMS) structure is needed. There does not appear to be a model of such a plan available elsewhere to replicate locally.

Project Description

The mission of this project was to develop a coordinated, integrated, and comprehensive disaster response plan for the San Mateo County Health Services Agency. The developed Plan addresses the disaster response for all Divisions within the Health Services Agency. It provides an organized and proficient response that is based upon the principles of the Incident Command system (ICS) and the Standardized Emergency Management System (SEMS). The detailed Plan encompasses all components of the health related response to disaster, including Emergency Medical Services, Aging and Adult Services, Environmental Health, Public Health, Mental Health, Food and Nutrition Services, the County Hospital and Clinics, Financial Services, and Health Information & Technology.

Tasks/Methodology

The beginning steps of the project involved identifying Division representatives as Task Force members for the project. Once the Task Force members were identified, they were given an "orientation" to the project and familiarized with the principles of ICS and SEMS. With the orientation completed, the current method (there was no written plan before this project) for disaster response for the Health Services Agency was identified. The consensus was that the current method was unacceptable and therefore did not appear to have any desirable components that should be implemented into the new plan. The current status of each Division's disaster plan was assessed once the Task Force had a good idea of where the project was going, including the present status of the Health Services Agency regarding disaster response preparation. The primary role of the Task Force members was to develop position checklists (also known as "Job Action Sheets") for the Division representatives in the Health Services Departmental Operations Center

(DOC).

The San Mateo County Office of Emergency Services and Project Coordinator combined SEMS training curricula to create a combination of SEMS Introduction and EOC Training for Division Representatives. Overall, a total of over 100 Health Services Management and key personnel were trained in the Introduction/EOC SEMS. This proved to be a worthwhile investment when it came to the disaster drill in June. In the first quarter of the project, it was discovered that having well developed disaster plans in place for each Health Services Division is an essential component of this project. The project continued to provide support and input to the Divisions for the development of their disaster plans; however, the amount of work that needed to be done on this component of the HSADP exceeded the scope of this project. Although the divisions did not produce their individual plans in this project, they did develop position checklists for their Division representative in the HS DOC. Constant reference was made to the Vision and the principles of ICS throughout this process which drove the continual revision of the ICS chart. The ICS checklists were put to a test in the "first ever" Health Services Disaster Drill, held in the new HS DOC. Supplies and resources for disaster "kits" were identified by the Task Force.

For the products of the project, we identified the areas we felt would be of primary concern: how was the project done and what could be used as "boiler plate". The products of this project include a copy of this report, which outlines every step of the process including challenges, and a copy of the San Mateo County Health Services Agency Disaster Plan (HSADP). This report will hopefully serve to describe what we did, how we did it, and what challenges we encountered in the process.

Outcomes

With the exception of the "Development of Division Disaster Plans", all of the objectives of this project were met. Instead, the checklists for each Division represented in the HS DOC were developed.

The final product of this project is a Health Services Agency Disaster Plan. It includes a narrative portion which coincides with that of the County Disaster Plan and an ICS/SEMS section which includes an ICS Chart and corresponding position checklists.

Conclusion

The Health Services Agency Disaster Plan is a vast improvement over what was in place for the health and medical disaster response in San Mateo County. Prior to the development of this plan, the EMS Agency played the primary role in the medical/health response and utilized the Medical Annex (Annex D) of the County Disaster Plan for disaster response. The Health Services Agency did not have a process in place for responding to disasters and relied upon the role of the EMS Agency as a guide. The disaster response, by virtue of the implementation of SEMS, has been redistributed to the most appropriate levels and people. Mechanisms for coordination and communication in and among the divisions and key management have been put in place. Education about ICS and SEMS has been provided to over 100 Health Services Agency personnel. A Health Services DOC has been established and tested.

Upgrade Existing HEICS Plans

Grantee:
San Mateo County EMS Agency
Project Number: EMS-6040
Project Period: 09/01/96-09/30/98
Project Amount: $44,990.00

EMS Administrator:
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225 West 37th Avenue
San Mateo, CA 94403
(650) 573-2564

Project ends September 30, 1998. Final Report and Abstract Report will be due November 30, 1998.

Paramedic Injury Prevention Program

Grantee:
Santa Barbara County EMS Agency
Project Number: EMS-6020
Project Period: 07/01/96-03/31/98
Project Amount: $60,000.00

EMS Administrator:
Nancy LaPolla
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(805) 681-5274

Introduction

In response to the increasing incidence of fatalities and morbidity due to unintentional and intentional injuries, Santa Barbara County EMS Agency, in collaboration with a diverse number of community-based agencies and American Medical Response, developed and implemented a community-based injury assessment and referral program. Like Diseases, injuries do not occur at random and are preventable. ALS and BLS providers can furnish an entry into a continuum of injury prevention services. These providers have the opportunity to directly observe at-risk situations and intervene, on site or through referral, to prevent the incidence of injuries.

Project Description

Throughout the State, ALS and BLS providers have primarily been responsible for the treatment and/or stabilization of injuries by responding to a situation after the injury occurred. We believe these providers could take a more proactive role and be the first step in a continuum of preventive services, thus building on a coordinated approach to injury prevention.

The goal of this project was to train EMT/Paramedics to: 1) assess the site for at-risk situations (i.e., child abuse), and 2) provide an educational intervention or referral, at the client's request, to a community-based health educator or another appropriate resource. The EMT/Paramedic was responsible for identifying a situation that had a potential for injury. These situations include: a motor vehicle incident with no use of restraints, a bicycle accident with no helmet, a home that has not been child proofed or is prone to injuries. i.e., accessible products that could cause poisoning, a suspicion of neglect or abuse with a child or elder, and an incident that is suspected to have involved domestic violence. The educational service or referral was offered, with an emphasis on the fact that it is voluntary and that "we are here to help with keeping you and your family safe from injuries".

Tasks/Methodology

The specific objectives are:

- To form a core assessment/education team of a minimum of 10 EMT/Paramedics who are employed by local agencies to participate in PIPP.
- To develop a PIPP protocol for in-home/on-location assessment and appropriate intervention as well as for implementation tool for referrals.
- To implement a training program for the home-based health educator team on in-home assessment, injury prevention education, and community-based resources.

- To develop a data management system on the computer to maintain the documentation of the number/type/location of referrals, date/type of education delivered, and the date/type of follow-up, as well as an assessment of the change in behavior/ environment.

- To refer a minimum of 100 individuals and/or families to the home-based health educator team and/or community-based resources for education and/or assistance.

- To provide injury prevention education and/or assistance, and follow-up contacts to assess for a change in the at-risk behavior/situation, with a minimum of 50 individuals/families.

Outcomes

Local agencies and individuals were brought into the project and formed into a task force. EMS initially trained a team of eleven paramedics for the PIPP program. A five-hour session focused on training PIPP members in the eight specific areas of injury prevention. As the need for PIPP paramedics increased, additional training sessions were implemented. The EMS agency participated in over fifty hours of ride-alongs to additionally train and observe how paramedics conducted referrals.

The PIPP team conducted approximately fifty referrals. Of those fifty referrals, Health educators conducted a total of twenty-three follow-ups including additional home visits. Paramedics handled the majority of the calls by either referring patients to an additional community resource or providing them with information directly on scene. PIPP paramedics conducted all referrals appropriately. Community members genuinely appreciated and recognized the significance of the PIPP service.

Conclusion

The PIPP prevention program controlled twenty-three potentially dangerous situations however, the number of referrals conducted did not meet the goal. The paramedics' were hesitant toward conducting interventions for a variety of reasons. Paramedics believed that interventions were an invasion of privacy, not a part of their job description, and that there was not enough time to conduct a referral at the scene. Moreover, from the beginning, misconceptions regarding the PIPP program spread among the paramedics and were difficult to overcome. The EMS agency has identified several ways to overcome similar obstacles that may appear in future community projects.

In the future, paramedics should recognize programs like PIPP as an effective means of injury prevention and not as an invasion of privacy. Community based projects should enhance paramedics' job description and become a mandatory part of their duty. Negative pre-conceived notions regarding injury prevention could change with a training program. Furthermore, ALS/BLS institutions should include a prevention module as part of their curriculum.

Perhaps an innovative "Masters" program would motivate paramedics to participate in more community based projects. Paramedics who truly want to advance their careers by promoting prevention activities could be allowed to create or assist in additional programs outside of their basic "job description". This type of program incentive will expand the responsibilities of interested individuals, benefitting the overall health of our community.

Outcome Data

Grantee:
Santa Barbara County EMS Agency
Project Number: EMS-6041
Project Period: 09/01/96-08/31/97
Project Amount: $39,985.00

EMS Administrator:
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Santa Barbara, CA 93110
(805) 681-5274

Introduction

Local hospitals and Santa Barbara County Emergency Medical Services (EMS) lack access to Emergency Department (ED) statistical information on patient care and the outcomes of this treatment. Presently, local hospitals and the EMS agency cannot assess protocols, procedures and outcomes.

In order to improve hospital and system-wide Continuous Quality Improvement (CQI), it is essential to be able to collect data on ED patients and their treatment from entry to ED to their department from the hospital. This information will assist each hospital in identifying potential areas of improvement. It will also benefit the EMS agency in assessing certain clinical pathways that are used in the EDs and to identify which pathways are most effective for the EMS system.

Methodology

Santa Barbara County retained a consulting firm to assess needs, resources and feasibility for development of an emergency department outcomes component within the county-wide EMS information system. To this end, CALES & ASSOCIATES interviewed staff of all seven Santa Barbara County hospitals, visited with EMS stakeholders (including county government and other EMS providers) and researched the current EMS information system market. Additionally, three California county EMS systems with emergency department outcome capabilities were visited.

Information gleaned from these sources was compiled into a report on the feasibility of a comprehensive data system. The report includes several proposed options if such a system were implemented.

Recommendations

It is recommended that Santa Barbara County enter into a partnership with the hospitals countywide to implement a micro-computer-based EMS information system to integrate prehospital, emergency, and trauma data countywide. Key features include:

- Entering into a partnership with Santa Barbara County hospitals that establishes a win/win strategy to help hospitals improve patient care while helping EMS improve public health.
- Implementing a micro-computer-based EMS information system that balances features and cost by 'layering' existing hospital mainframe and mini-computer systems and the proposed EMS microcomputer system.
- Adopting the CDC guideline for standardized emergency department data that establishes a three-tiered standardized data set (see appendices) to be implemented in three phases over a mutually agreed upon time period.
- Defining uniform criteria for patient

inclusion that separates patients based on system access (including outpatients, clinics, urgent care, emergencies, observation and direct admits).

- Instituting national guidelines for minimum and recommended data that includes standards for prehospital, emergency, and trauma data that facilitate data comparison both locally and nationwide.
- Expanding the EMS information system to include computer-aided dispatch (CAD) data and the inclusion criteria to include basic life support (BLS) patients.
- Pursuing additional funding from the California EMS Authority that extends the current planning project into an implementation project, including funds for necessary software and personnel.
- Developing a Request for Proposal to implement the proposed system that offers EMS opportunity to compare products and services, including a pre-proposal vendor conference (see vendor questionnaire in appendices), prior to actual procurement of a system.

Conclusion

Contingent upon procurement of additional grant funding, implementation of a micro-computer-based EMS information system is feasible and would benefit both local hospitals and the EMS agency. Acquisition of this system would generate essential hospital-specific and system-wide data and establish Santa Barbara County as a leader in EMS, both within California and nationwide, by providing the state of the art in EMS information.

Critical Incident Stress Debriefing Training

Grantee:
Santa Barbara County EMS Agency
Project Number: EMS-6042
Project Period: 09/01/96-08/31/97
Project Amount: $7,399.00

EMS Administrator:
Nancy LaPolla
300 North San Antonio Road
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(805) 681-5274

Introduction

In 1990, Santa Barbara County Mental Health Services, Emergency Medical Services, and the Fire Department collaborated, with disaster recovery grant moneys, to develop a Critical Incident Stress Management Program. The program was designed to provide Jeffrey Mitchell, Ph.D. model debriefings at the request of local EMS providers when personnel had been involved in a response that generated high emotional impact.

With attrition and no local training opportunities, the team had downsized to 10 mental health members and 10 EMS peer members.

Project Description

The primary goal of this project was to bring Dr. Mitchell to Santa Barbara for a two day basic training, funded by the grant and free to the students, who wished to apply for team membership. Our projection was to train twenty additional team members.

The following objectives were established and met to accomplish that goal:

- To hire a training coordinator.
- To develop and distribute training brochures.
- To recruit a minimum of twenty (20) prospective team members.
- To train a minimum of twenty (20) team members.
- To develop a training evaluation tool.
- To assess the evaluations.
- To continue to provide on-going administrative support with the Santa Barbara County Mental Health Department and the Santa Barbara County Fire Department for the Critical Incident Stress Management Program.

Outcomes

Jeffrey T. Mitchell, Ph.D., presented a two day Basic Critical Incident Stress Debriefing training, which is one of the prerequisites to team membership. Seventy one (71) peer and mental health personnel received this training. Evaluations verified that students rated the class as good to excellent.

These trained personnel are completing mandated Ride-A-longs and interviews with the Director and Program Coordinators. We are introducing new members to actual debriefings as support to the leadership of seasoned debriefers.

Conclusion

This one-time opportunity to provide local training, at no cost to registrants was met with enthusiasm and success. It provided a refresher to managers of EMS providing agencies about the value of commitment to the program. We were able to enhance team

membership threefold which will un-complicate the process of assembling a debriefing team when an EMS providing agency requests help.

Emergency Medical Services For Children (EMSC)

Grantee:
Santa Clara County EMS Agency
Project Number: EMS-5053
Project Period: 06/30/96-06/30/97
Project Amount: $80,000.00

Acting EMS Administrator:
Robert W. Heilig
645 South Bascom, Rm. 139
San Jose, CA 95128
(408) 885-4250

Introduction

In 1994, the Emergency Medical Services (EMS) Agency began the process of developing a comprehensive plan for Emergency Medical Services for Children (EMSC) in Santa Clara County. The Emergency Medical Services for Children Taskforce was developed as an advisory body to the EMS Agency. The Taskforce is a multi-disciplinary group comprised of committed individuals representing the medical community.

Project Description

The Taskforce was directed to:

- Provide advice and assistance to Santa Clara County EMS Agency and the Department of Health on the preparation and submission of a special project grant to the State of California, Emergency Medical Services Authority for the purpose of development and implementation of a comprehensive EMSC system for the County.
- Assist the County with assessing resources and services for children and identify problems in providing care for injured and critically ill children.
- Advise and assist the Agency on the development of appropriate policies, criteria, and guidelines for each component of the EMSC system.
- Advise and assist the Agency on implementation strategies for each component of the EMSC system.

In 1995, the Agency was awarded an EMSC planning grant and hired Ann Pettigrew, M.D., from the Pediatric Intensive Care Network of Northern and Central California to provide consultation to the project. The grant also allowed the Agency to hire a full-time nurse coordinator for the project. In 1996 the Agency received an implementation grant to continue the foreward momentum.

Tasks/Methodology

The Taskforce utilized multiple subcommittees working in a consensus fashion to develop specific work products. The work products included the development of:

- Equipment lists for prehospital providers.
- Twenty-seven (27) Pediatric Prehospital Treatment Protocols.
- Inter-facility Transport Guidelines.
- Inter-facility Transfer Consultation Guidelines.
- Guidelines for Basic Emergency Departments.
- Pediatric Critical Care Center Standards.
- Child Injury Prevention Conference January 1997.
- Assistance with successful application for National Highway Traffic Safety

Administration Safe Communities grant.

Outcomes

Work products as described above; on-going EMSC Taskforce with a defined multi-disciplinary structure and specific goals; successful site visits to PCCCs and subsequent recognition of three *(3);* all ED's working to achieve compliance with ED guidelines; on-going commitment of the EMS Agency and County Public Health Department to continue a special focus on pediatric emergency medical care issues.

All areas of this on-going project are progressing in a positive way. There is a clear commitment to improving all aspects of pediatric emergency care on behalf of the EMS Agency and all providers. Avenues of communication have been developed. Coalitions, affiliations and networks are resulting from the shared goals of all participants.

The EMS community is more aware of the unique needs of pediatric patients and is committed to improve quality care through training, implementation of policies and protocols and facility guidelines.

Enhanced EMT-I Scope of Practice

Grantee:
Santa Clara County EMS Agency
Project Number: EMS-6043
Project Period: 09/01/96-08/31/97
Project Amount: $40,000.00

Acting EMS Administrator:
Robert W. Heilig
645 South Bascom, Rm. 139
San Jose, CA 95128
(408) 885-4250

Introduction

Currently, ALS trained and equipped first responders are available in half of Santa Clara County, with the remainder being served by early defibrillation trained EMT-Is. Though the "care gap" between BLS first responder arrival and paramedic transport arrival is relatively short in an urban/metropolitan EMS system, public expectation and the desire to improve service levels has been enormous. Agencies not able to sustain a paramedic program have been left searching for options that meet their community's needs.

Project Description

The purpose of the project was to engage in a prospective trial study to determine the ability and/or benefit of EMT-Is performing certain clinical interventions currently restricted to paramedics, and to identify therapeutic benefit or other advantages to EMT-Is in an urban setting initiating common simple clinical interventions during the interval between the arrival of BLS first responders and the ALS transport ambulance.

The interventions proposed for study were selected based on simplicity and ease of use, potential clinical benefit, time needed to perform the intervention, and frequency of use.

Tasks/Methodology

The trial study proposal was developed by the EMS Agency using other trial study proposals as a guide. The draft was reviewed and approved by the local Medical Control Advisory Committee, and a Project Manager identified. Project objectives included securing qualified instructors, developing a compressive training program, identifying and training test and control groups, procuring supplies and materials, and implementing a mechanism for data collection and analysis.

Development of specialized aspects of the project were accomplished by personnel with expertise in training, curriculum development, and data systems. Project progress and outcome was continuously evaluated in cooperation with the participating agencies.

Outcome

A prospective trial study is currently underway. Test group personnel have been trained and equipped, and are submitting data as required. An "off the shelf' training package was also developed which can be utilized by other agencies with minor modification for local conditions/protocols.

Conclusion

Local response to the Enhanced EMT-I Practice project has been very positive. The students have noted on multiple occasions that they found that the training improved their general assessment skills, has made them

better EMT-Is, and a more valuable asset to the paramedics. Further, providing the additional skills has virtually eliminated the lag time between completing their BLS interventions and arrival of the transport ambulance.

It is anticipated that the trial study funded by this project will demonstrate that EMT-Is with sufficient additional training are able to adequately and appropriately perform the identified interventions prior to ALS arrival. The community benefit will be an EMS system that can deliver improved services in a cost effective and needs appropriate manner.

Alternative Method of Delivering EMS

Grantee:
Santa Cruz County EMS Agency
Project Number: EMS-5054
Project Period: 06/30/96-06/30/97
Project Amount: $78,280.00

EMS Administrator:
Don Hiatt
1080 Emeline Avenue
Santa Cruz, CA 95061
(408) 454-4120

Introduction

The need for emergency medical services system redesign has become universally apparent. Most EMS agencies are struggling with determining what are the needs and how to reposition the EMS community players to be more effective within an integrated system. Santa Cruz County, in its effort towards system redesign, has made an observation that is a common system issue. The observation which is the basis for this grant project is that of the four basic players (hospitals, fire services, contract transport paramedics services, and County EMS agency) in the system, fire services and the County EMS agency are the only community entities that are not transient in nature. Yet fire services are often the least well integrated into the system design. Regardless of the often heard fire theme that they have a superb mutual aid response program, the reason that fire mutual aid is required is because of their territorial nature. A good example of the self-limitations of a fire jurisdiction is one that has paramedics, whereas paramedic services are seldom extended to other fire jurisdictions as a matter of daily operational policy. This limitation means that the county, in order to offer EMS services to all its citizens county-wide, must contract for private services thus creating in some fire service areas with existing paramedics, redundancy and operational inefficiencies.

It is the goal and intent of this grant to create an organizational structure that will allow existing fire services as members to act as a single entity in the delivery of fire service related paramedic services. This new organization is intended to act as a single administrative oversight group for the delivery of paramedics services without its members losing their individual corporate identity. The principle in this regard is to provide an organizational structure of fire services that can negotiate with private paramedic services and thereby reduce service redundancies and inefficiencies.

Project Description

The single fire administrative organization thereby could provide the following opportunities: a) develop a single quality assurance plan, b) provide all of the QA oversight and review on behalf of its fire members, c) provide a single voice to and from the County EMS agency, d) act as the single bargaining agent with the County and contract paramedic services, e) interact with medical control hospitals, as a single agency, and f) provide its member services BLS-related programming e.g. CEU's for EMT-Is, EMT-D oversight and training, etc. (This latter issue would be a good reason non-ALS interested services could be encouraged into membership). Ideally, the newly created organization could act as its own arbitrator in determining if a newly proposed program might be injurious to a neighboring EMS fire program. The development of the desired

administrative organization could have been patterned after a number of organization types, e.g. joint powers, cooperative, an association, etc..

The grant proposed hiring a consultant to: 1) make a recommendation of the best structure for the potential members, 2) survey membership interests, 3) create the desired organizational design and potential duties, 4) draft a charter and related by-laws, and 5) convene at least one meeting of the interested members.

Tasks/Methodology

Although the grant was administered through the County EMS Program, an existing EMS Subcommittee of the Fire Chiefs' Association was tasked with the oversight and project steering. This Subcommittee considered other project consultants and eventually hired Lazar and Associates. Lazar and Associates was particularly adapted for this project because of a contract they were previously awarded in preparing a study of the role of fire services within Santa Cruz County. Also helpful is the fact that the consultant had a working relationship with a project similar in concept in Clackamus County, Oregon.

The consultant was tasked with: a) making a recommendation regarding the administrative structure, 2) develop and organization charter and by-laws, 3) meet with interested fire groups to answer program questions, and 4) ultimately convene one meeting of the new group. All of this was done with the support and oversight of the EMS subcommittee.

Outcomes

The consultant Lazar and Associates was successful in meeting all of the project goals and on July 20 convened the first meeting of the Emergency Medical Services Integration Authority (EMSIA) a joint powers agency consisting of eleven of the twelve fire services.

Conclusion

In fact, a single organization has been formed. To date the EMSIA is in the process of reviewing the proposed new paramedic contract to make sure the contract will allow for new roles and relationships with fire services. In addition, one member agency has submitted for consideration by the EMSIA an application to provide paramedic services. The application process is proving to be an excellent vehicle for clearer definition of organizational goals and objectives. Also, the EMSIA has conducted a goal setting conference which provides an opportunity for the group to consider wider boundaries.

In summation, a single organizational structure developed that allows member fire agencies to maintain their separate corporate identity while evaluating, planning, and developing common EMS interests. The newly formed EMSIA is a joint powers authority with its eleven members that is taking the steps necessary to provide, in concert with the County contracted paramedic services, the provision of integrated advanced life support system county-wide.

Emergency Medical Services For Children (EMSC)

Grantee:
Sierra-Sacramento Valley EMS Agency
Project Number: EMS-5055
Project Period: 06/30/96-09/30/97
Project Amount: $43,800.00

EMS Administrator:
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Introduction

Beginning in FY 1988, the Sierra-Sacramento Valley (S-SV) EMS Agency completed a series of three EMSA special project grants that made possible the development and implementation of a regional pediatric emergency and critical care (EMSC) system. During the three year project, a number of guidelines and standards were developed and implemented. Two facilities, Sutter Memorial Hospital and UC Davis Medical Center were reviewed and designated as Pediatric Critical Care Centers (PCCC). Consultation/educational site reviews were conducted at all regional base hospital emergency departments, including all base hospitals in Sacramento County.

In 1994, the EMS Authority completed and disseminated the "California EMSC Model". The Model defines the core components of an EMSC system and includes guidelines and recommendations for EMSC system planning, development and implementation.

Project Description

The purpose of the 1996-1997 Grant #5055 was to assess the S-SV EMSC system, that had been developed and implemented from 1988-1991, and to integrate the EMSA EMSC guidelines into the existing S-SV system. Specific objectives of the project were to review and update the guidelines related to pediatric capabilities of emergency departments, pediatric inter-facility transfer programs, and the pediatric critical care center standards. Upon completion of the review and update of the guidelines and standards all S-SV regional emergency departments were reassessed for compliance to the established voluntary guidelines. Site reviews were conducted at both PCCC's for compliance to the PCCC standards. All EMSC components were reviewed and updated.

Tasks/Methodology

The Pediatric Intensive Care Network (PICN) of Northern and Central California was contracted to provide consultant services to complete the project objectives. Dr. Ann Pettigrew, PICN Executive Director, was also the consultant during our initial three year grant period.

The S-SV Regional Pediatric Advisory Committee, that was formed during the initial grant, was utilized as the foundation for a broad-based pediatric task force. The task force advised the EMS agency on all phases of the assessment, update and implementation of the revisions and new additions to the S-SV EMSC System.

The existing S-SV guidelines and standards were compared with the EMSA EMSC guidelines and recommendations. All deficiencies were integrated into the existing S-SV documents. The "draft" documents

were widely distributed for review and comment. The final documents were approved and implemented through the established S-SV policy/procedure approval process.

Outcome

All of the existing S-SV EMSC components and documents were reviewed and updated, to include the State EMSC recommendations/guidelines. The Pediatric Inter-facility Transport Program guidelines were adopted as standards. Both PCCC's were required to meet those standards, in addition to the Standards for Pediatric Critical Care Centers, when the PCCC designation site evaluations were conducted.

All eight regional emergency departments participated in the consultation/education visits to reassess compliance to the voluntary guidelines for pediatric capabilities of emergency departments. Feedback from all of the base hospitals was very positive following the visits. All hospitals expressed appreciation for the assistance provided by the consultant team. The team consisted of one representative from each of the two designated PCCC's. Because of the time involved in coordinating the physician and nurse team member schedules with the hospital personnel schedules, a consultant was utilized to coordinate and conduct the emergency department visits.

A three member team of pediatric emergency and critical care experts was utilized to conduct the PCCC site evaluations for re-designation. A "self assessment" packet was completed by each facility prior to the site visit. Access to the completed forms prior to the site visit was very helpful to the site review team members.

Conclusion

This grant provided a unique opportunity to examine our success and/or shortcomings in the EMSC System that was developed and implemented from FY 1988-1990. All components of the S-SV EMSC system were reviewed and updated.

Overall, it was evident that the ED's are well prepared to care for pediatric patients. The equipment available is outstanding at all facilities. The area of most concern is the lack of PALS, or equivalent education, for the nursing staff at some facilities. The education/consultation visits went extremely well. A common response to the visits was "we should do this more often".

Active involvement of EMSC system participants is required to successfully complete the project objectives. This has resulted in a heightened focus on pediatric emergency and critical care throughout the system.

Prehospital Data Collection

Grantee:
Sierra-Sacramento Valley EMS Agency
Project Number: EMS-6021
Project Period: 07/01/96-06/30/98
Project Amount: $52,000.00

EMS Administrator:
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Project ends June 30, 1998. Final Report and Abstract Report will be due August 31, 1998.

Emergency Medical Dispatch (EMD) and Managed Care

Grantee:
Solano County EMS Agency
Project Number: EMS-6045
Project Period: 09/01/96-02/28/98
Project Amount: $55,000.00

EMS Administrator:
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Introduction

Emergency Medical Services (EMS) systems in California developed rapidly and aggressively in the 1980s leading to a significant and measurable decrease in the mortality and morbidity of persons suffering from acute injury and/or disease. However, this has also resulted in a most unique and difficult paradox in that demands for service have increased steadily over the last several years to a point where traditional response, i.e., Code 3 fire and ambulance to almost all 9-1-1 requests, is placing an ever-increasing burden on providers, both public and private to meet these demands. There is also increased public expectation of the types of service (i.e., paramedic) that they will receive. Parallel to this increased dependence of the public on this safety net has been the steady and significant dwindling of available revenues in terms of both tax dollars and medical care reimbursement. Fiscal pressures have also exacerbated some of the inherent drawbacks of contemporary EMS systems: a fee-for-service model which is increasingly inconsistent with current trends in health care to capitate reimbursements; a lack of incentives for efficiency and reduced billable costs; a development scheme which has largely ignored the question of cost vs. outcome; a redundant system which allows for the duplication of dispatch services and advanced life support response.

Solano's EMS system has likewise been challenged by these pressures and an effective response requires the integration of managed care principles of risk management and access planning. A key area of EMS systems in which to employ these principles is emergency dispatching, the first contact point to the system.

Project Description

The scope of this project was to evaluate and adopt an existing "off-the-shelf" Priority Medical Dispatch program which incorporates not only pre-arrival instructions and the principles of call prioritization and augmented response to maximize an efficient utilization of resources, but also integrates pathway management options to be developed in conjunction with and approved by a consortium of health care payor entities in Solano County. The expected result would be a dispatch system which delivers the appropriate resource to the patient in the most appropriate and cost efficient manner possible, and would simultaneously be consistent with a value-added, capitated managed care model that incorporates principles for "in-plan" treatment considerations.

Tasks/Methodologies

The initial objectives of the grant were the review and selection of an existing Priority Medical Dispatch Program (PMDP), the development of a consortium of major health care payors in Solano County, the training of

dispatch staff of a selected PSAP in the augmented Priority Medical Dispatch system, integration of managed care protocols into the PMDP, data collection and analysis, and modification of protocols as necessary. Ultimately, these objectives had to be revised.

Selection of the PMPDP vendor was simplified by the fact that only one vendor, Medical Priorities, Inc., possessed managed care protocols suitable for use with the project. However, PSAP selection was complicated by local politics and contract negotiations with Medical Priorities became a substantial event. Once a PSAP was selected, dispatcher training was relatively straightforward.

Outcomes

This project fell short of the stated objectives to fully implement the augmented PMDP. This was due to two principal obstacles over the course of the project. PSAP selection became a political football, first with several agencies competing to be the site, then with no sites interested at all. This grant objective was ultimately modified to install the project at secondary PSAPs as a result of the lack of commitment from the primary sites. The second obstacle which was clearly not foreseen was contract negotiation between Solano County and Medical Priorities. Both entities possessed standard "boiler-plate" language unacceptable to the other. It became necessary to draft a customized contract from scratch and this process took several months.

Dispatchers at the secondary PSAP were trained as Emergency Medical Dispatchers and are now ready to move ahead with project implementation, including managed care augmentation.

Conclusion

Despite the setbacks of this project and the inability to fully accomplish the stated objectives, serious and necessary groundwork has been laid, both in terms of establishing necessary contracts, as well as gaining the support of a primary PSAP (Solano County Sheriff), such that moving ahead with the project as a continuation grant should enjoy a measurable amount of success. The concepts of a PMDP are much readily understood and changes in local PSAP management may enhance a willingness to move forward with this project by other agencies.

Securing a commitment from a PSAP early on, or even before beginning such a project would be desirable. This did not occur in this case because this project was unexpectedly funded with mid-year monies which did not allow the Agency sufficient time to secure such a commitment. As for contract negotiations, it is probably advisable to bring the legal experts into the process early so that needs and potential pitfalls can be quickly identified and resolved.

Regional EMS System Development

Grantee:
Sonoma/Mendocino County EMS Agency
Project Number: EMS-5056
Project Period: 06/30/96-06/30/97
Project Amount: $170,000.00

EMS Administrator:
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(707) 525-6501

Introduction

Historically, Sonoma and Mendocino developed their own respective EMS systems independent of the other with the exception of a strong peer support relationship which existed between the EMS Coordinators of each county. The resignation of the Mendocino EMS Coordinator in 1993 lead to discussions between the two counties regarding the potential for Sonoma County to provide EMS Agency services to Mendocino. Those discussions resulted a contractual relationship between Sonoma and Mendocino that was initiated in January 1994. As a result of this contractual multi-county EMS system relationship, both counties expressed an interest in exploring the benefits of formalizing the regional EMS agency and pursuing outside funding to assist in developing this regional system. The assistance of Federal Block Grant fund through the State EMS Authority aids the Sonoma/Mendocino EMS Agency in fulfilling the essential functions as an EMS Agency for this multi-county EMS system.

This report is the final project abstract report for the Sonoma/Mendocino Regional EMS System Development Project for FY 1996-97. Many of the objectives associated with this project were designed to be implemented over a period of 6-36 months.

Project Description

This regional EMS system development project was designed to focus on the major components of an EMS system as set forth in the State EMS System Standards and Guidelines. Initial EMS Agency activities were directed towards establishing the relationship between Sonoma and Mendocino Counties that is the foundation for this multi-county EMS system. The project established 7 major objectives:

- To improve system organization and management in the region.
- To increase and improve personnel and training.
- To improve communications systems in the region.
- To improve disaster medical preparedness in the region.
- To improve transportation and performance in the region.
- To improve public information and education in the region.
- To improve the assessment of hospitals and specialty care centers in the region.

Tasks/Methodology

Specific tasks were designed within the general objectives to accomplish the desired result. Major tasks included:

- Maintaining staffing of all allocated positions. (Achieved)

- C Maintaining contractual relationship between Sonoma and Mendocino Counties. (Achieved)
- C Revision of EMS plans. (Not achieved/Deferred pending completion of System Redesign Project)
- C Review & revise local policies to ensure compliance with state regulations. (Achieved)
- C Maintain QI programs and continue the upgrade of Mendocino County providers to the paramedic level. (Achieved)
- C Pursuing improvements in the region's communications system. (Partially achieved)
- C Standardizing and integrating ICS/SEMS based MCI/disaster plans for the region and maintaining disaster preparedness/response capabilities. (Achieved)
- C Developing/maintaining provider agreements. (Achieved - see final project report)
- C Review EMS aircraft utilization policies. (Partially achieved)
- C Improve public awareness of EMS. (Achieved)
- C Continue development of specialty care center, e.g. trauma center. (Target of another special project grant proposal)

Outcome

As noted above, many of the objectives were proposed to be implemented over a period which extended beyond the contract period associated with this project. Consequently, many although not all of the specific objectives were completed during this funding period. Detailed information regarding this project and associated objectives/tasks, methodology and implementation schedule is contained within the quarterly report documents and final project report.

Conclusion

It is quite clear that the Sonoma/Mendocino EMS system has received and will continue to realize many positive benefits from the activities associated with this project. It is anticipated that continued funding of this project will result in completion of not only the objectives established within this project proposal, but those of future project funding periods.

Regional Trauma System

Grantee:
Sonoma/Mendocino County EMS Agency
Project Number: EMS-6022
Project Period: 07/01/96-06/30/97
Project Amount: $38,000.00

EMS Administrator:
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(707) 525-6501

Introduction

In 1987-88 the issue of the need and/or desire for a local trauma center was a topic of discussion by the Sonoma County Board of Supervisors and local EMS committees. Numerous issues were debated within the local medical community including the advantages/disadvantages to patient care and the potential impact such a system would have on all hospitals including the smaller outlying hospitals in the county. At that time, no action was taken to proceed with formalizing a trauma care system or designating a local trauma center.

In August 1995, attentions were again focused on the local EMS trauma system when issues arose regarding neurosurgical care. During the course of discussing those issues, the need and desire for formalizing the local trauma care system and exploring the designation of a trauma center was a consistent topic. Representatives from local hospitals and the medical community indicating a strong desire to develop a trauma plan and to designate a trauma center for our area contacted EMS staff. Multiple EMS Advisory Committees also identified the issue of assessing and improving trauma care as a priority in the development of our local EMS system.

In response to those discussions, the EMS Agency submitted a proposal seeking block grant funding from the State EMS Authority to examine trauma care in our region, develop a trauma plan and, if indicated, pursue designation of a Level II trauma center. The trauma system development project is broken into 2 distinct and separate phases. Phase 1 has included a needs assessment which analyzed data regarding local trauma care and the volume of patients suffering traumatic injuries, and the drafting of an EMS Trauma Plan. Phase 2 addresses implementation of an approved Trauma Plan including the potential designation of a Level II Trauma Center, if indicated.

Project Description

This project will make possible the development of an improved regional trauma care system and designation of a Level II trauma center. It is intended to improve the availability and level of trauma care to acutely injured patients not only within the Sonoma and Mendocino Counties but also for the entire surrounding region. Completion of the proposed objectives will result in the establishment of a Level II trauma center capable of receiving and caring for patients from the entire north bay/north coast region.

Objectives have been identified to address problem areas which exist in the local trauma care system and to provide the focus for activity during the funding period. In general, the objectives of the project include:

- Retaining an independent consultant in trauma system design and development to assist in completion of the project.
- Preforming a needs assessment to establish a basis for development of a trauma plan.
- Developing and implementing agreements with neighboring jurisdictions regarding care of trauma patients.
- Developing a trauma plan for submission and approval by the State EMS Authority.
- Developing a process for the selection and designation of a Level II trauma center.
- Establishing a mechanism for the on-going review and evaluation of the trauma care provided within the proposed system.

Tasks/Methodology

Specific tasks were designed within the general objectives to accomplish the desired result. Major tasks included:

- Hiring a trauma consultant. (Achieved)
- Completing a survey and developing a needs assessment document. (Achieved)
- Establishing contact with neighboring EMS systems to ascertain the potential for participation in the proposed trauma system and developing agreements to formalize their involvement (Partially achieved). Final action of establishing agreements on hold pending approval of Trauma Plan and formal selection/designation of TC)
- Develop a trauma plan. (Plan has been drafted and public hearing set. Plan will be submitted to State after local approval process is completed.)
- Select and designate a Level II Trauma Center. (Pending. See Outcome below.)
- Establish a review and evaluation mechanism for the trauma system. (Pending. See Outcome below.)

Outcome

As of the date of this report, a trauma plan has been drafted and distributed for public comment. A public hearing is scheduled to receive additional comments. It is anticipated that a final plan will be approved by the County and submitted to the State by November 1997. The primary problem encountered during the process has been related to environmental issues associated with the designation of a local trauma center. Specifically, issues related to the need for compliance with the California Environmental Quality Act (CEQA) have been identified which have resulted in the need to incorporate compliance with the Act into the overall process. This factor has significantly delayed the project in total and will result in an extended time line before a final selection and designation of a trauma center can occur. Additionally, compliance with CEQA will result in significant expenditures not originally anticipated.

Conclusion

It is quite clear that the Sonoma/Mendocino EMS system has received and will continue to realize many positive benefits from the activities associated with this project. Despite the setbacks associated with the CEQA issues, the EMS Agency will continue efforts to complete the project objectives as proposed.

Medical Health Disaster Preparedness

Grantee:
Sonoma/Mendocino EMS Agency
Project Number: EMS-6046
Project Period: 09/01/96-08/31/97
Project Amount: $10,000.00

EMS Administrator:
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(707) 525-6501

Introduction

The Sonoma/Mendocino EMS system is a blend of urban, suburban and rural/frontier environments with a population base of 500,000+ persons in a five thousand square mile area. Emergency medical services range from volunteer-staffed basic life support ambulances to professional paramedic staffed, high performance contract providers, and multiple air rescue/air ambulance services. Geography and distance factors result in a system in which transport times vary from a few minutes to over two hours. The region is a high tourist use area that includes coastal resorts, winery-based industry and numerous parks/recreational areas.

Disasters and multi-casualty incidents are not uncommon within the region. While on a functional basis, the response to such disasters and MCI's has been adequate, the system lacked a formal coordinated management structure for the purposes of planning/preparation and disaster response. The Multi-hazard Emergency Response Plans for both counties were outdated and not compatible with SEMS standards.

As a component of planning and preparedness, resource lists had not been developed or updated to reflect the availability of specialized personnel/services that might be needed during a disaster. Along the same line, the EMS Agency did not possess the capability to communicate from remote locations, health department based disaster operations centers or hospitals with the emergency operations centers via any mode other than land-line based telephones. A lack of the ability to transmit and access data via computers was also identified as a shortcoming.

This report is the final project abstract report for the Sonoma/Mendocino Medical Health Disaster Preparedness Project for 1996/97 that was designed to address the issues outlined above.

Project Description

This project was designed to make possible the continued development and improvement of a coordinated Medical Health disaster preparedness, response and recovery system in Sonoma and Mendocino Counties. It was intended to upgrade and establish (were lacking) the communications linkages, resource directories, and Health Department Disaster Operations Centers' response and recovery capabilities in both counties. In general, the project objectives included:

- Establishing redundant communications capabilities for DOC/EOC/hospital/ forward command post operation coordination.
- Creating a computer based medical health resource directory.
- Establishing a computer based and accessible disaster operations documentation capability.

- Revising the Medical/Health annexes of the Counties' multi-hazard response plans to be SEMS compatible.

Tasks/Methodology

Specific tasks were designed within the general objectives to accomplish the desired result. Major tasks included:

- Creating a computerized medical health disaster response & recovery directory. (Achieved)
- Revising the Counties' medical health disaster plans/annexes to be SEMS compatible. (Achieved)
- Establishing redundant communications capability between the Health Department Disaster Operations Center's, hospitals and/or Incident Command Post. (Achieved)

Outcome

All objectives were completed however the formal approval of both counties' multi-hazard plans (MHP) has not occurred. Notwithstanding this fact, the EMS Agency has used the medical/health plans and annexes that were developed for inclusion in the MHP to manage actual response to local disasters over the past two years (flood related incidents). The EMS Agency purchased portable computers and cellular telephones that are capable of providing access to the resource data bases, EOC computer networks, and RIMS system. The Agency worked with local OES staff and RACES representatives to establish a system for utilizing non-telephone based communications (amateur radio) communications at remote locations such as hospitals, forward command posts, and health department disaster operations centers. This same communications system is now available to provide communications between the EOC and hospitals/incident sites in both Sonoma & Mendocino Counties.

Conclusion

It is quite clear that the Sonoma/Mendocino EMS system has received and will continue to realize many positive benefits from the activities associated with this project. This fact has been borne out during actual disaster incidents when EMS staff were the primary health/medical representatives at the EOC's and forward command posts. Being trained and familiar with a SEMS based response operation proved valuable to ensuring a successful response to local disasters. EMS staff have used the RIMS system to integrate and transmit data regarding the medical/health status of our counties during flood related incidents.

EMS System Redesign

Grantee:
Sonoma/Mendocino EMS Agency
Project Number: EMS-6047
Project Period: 09/01/96-10/31/97
Project Amount: $27,500.00

EMS Administrator:
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Introduction

The pending expiration of the EOA franchise contract was the primary impetus for undertaking a system redesign contract. Since the EOA was established in 1991, a number of significant issues were also beginning to impact EMS across the board. These issues included continuing statewide litigation surrounding the "201" phenomenon, managed care inroads, consolidation of providers and HMOs, and locally the desire of a number of fire departments to enter into the provision of either ALS response and/or transport. Additionally, the lack of Emergency Medical Dispatch (EMD) was viewed as a vital missing component that needed to be incorporated into the replacement system, given the movement of managed care into pathway management. EOA boundary lines and entities serviced also needed to be re-examined since much of the County's past litigation had centered around those issues.

Project Description

The project set out to support the coordination and development of an EMS system redesign project for the Sonoma portion of the Sonoma-Mendocino system. The project was to create a "redesign team" that would be comprised of agency staff and system stakeholders. With the assistance of a management-organizational development consultant, the team would work together to design a system blueprint. The team would conduct workshops, extract customer surveys from participants and develop recommendations for a system design from those survey results.

Tasks/Methodology

A project consultant was hired by the agency. The consultant and agency coordinated a series of informational workshops, with speakers and topics suggested by various advisory groups to the agency. The agency and consultant then coordinated and conducted a Future Search conference which produced a model of a delivery system and redesign project team (task force). The task force incorporated the present capabilities of the local system with the identified components produced by the Future Search. The task force refined and prioritized the various EMS system components and devised implementation time-lines. The task force produced a listing of system redesign/improvement recommendations and forwarded same to the local Board of Supervisors.

Outcomes

The project produced a system recommendation (an EOA), an implementation methodology (RFP) and a number of system enhancements: EMD, a consolidated system oversight group pulled from a number of advisory groups, treat and release-refer protocols, mixed resource configuration - BLS ambulances, ALS engines etc. mutual aid as a method for establishing boundary drops, a

recommendation to update and submit a system EMS Plan reflecting the recommended changes, modifying the county's emergency medical response ordinance and lastly establishing not only a methodology for working together but also an alliance based network of stakeholders.

Conclusion

The net impact is that the agency has a consensus driven and produced blueprint and plan for implementing an EMS system for the future. It is a system that touts partnerships and cooperation and collaboration. It is a system supported by a network of stakeholders who have worked side by side for over 18 months on issues that they care about and have ownership of. It is a system that has taken up the mantra of "right resource to the right patient the first time all the time". It is a system that will eventually be boundary blind with patient care as the driving concern.

The modifications we would make would include starting sooner, count on collaboration but recognize its time requirement and don't wait for a redesign project to forge strong cooperative partnerships between your stakeholders. Recognize that "we have seen the enemy, its us", as these demanding times change so must our attitudes and willingness to respect mutually valid viewpoints.

Emergency Medical Dispatch (EMD)

Grantee:
Ventura County EMS Agency
Project Number: EMS-5057
Project Period: 06/30/96-11/30/97
Project Amount: $65,000.00

EMS Administrator:
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Ventura, CA 93003
(805) 677-5270

Introduction

Ventura County EMS identified a need to augment the present Emergency Medical Dispatch procedures by the addition of a Prioritized Dispatch component.

Project Description

This project proposed to develop a Prioritized Dispatch component to the existing Emergency Medical Dispatch procedures. The Prioritized Dispatch component was composed of new response configurations for emergency response, a new format for the EMD protocols, and a dispatcher training curriculum.

Tasks/Methodology

A committee composed of a broad representation from EMS system constituents was instrumental in the development of the parts of the new Prioritized Dispatch program. The committee met frequently over a one-year period to plan, based on the Medical Directors's outline, the dispatch cards and response configurations. The curriculum for the trainers was developed by the Medical Director.

Outcomes

- EMD Program with Prioritized Dispatch Component
- Response Configurations
- Train the Trainer Curriculum

Conclusion

The implementation of this program will allow Ventura County Emergency Medical Services agencies to respond to patient needs with the right level of service at the right time.

Emergency Medical Services for Children (EMSC)

Grantee:
Ventura County EMS Agency
Project Number: EMS-6048
Project Period: 09/01/96-08/31/97
Project Amount: $65,000.00

EMS Administrator:
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Introduction

Ventura County EMS identified a need for improvement in the way pediatric patients are handled in the prehospital and hospital setting. The goal of the Ventura County EMS Agency was to develop and implement an improved EMSC System which serves children and their families countywide. This goal will continue throughout year 2 of the grant as well.

Project Description

This project proposed to develop an EMSC Master Plan for the County of Ventura. The major objectives included development of organizational and administrative structure, implementation of policy and procedures for prehospital personnel and dispatchers and to develop recommendations for information management and data collection.

Conclusion

The Ventura County EMS Agency has made the following changes/improvements during the year 1 grant:

1. An EMSC Coordinator was hired.
2. A sub-committee was formed to help guide the project.
3. Equipment surveys were completed of each ambulance and hospital within Ventura County.
4. The development of EMS Master Plan was initiated.
5. VC Policy and Procedures were reviewed and recommendations for changes were made.
6. Data Collection and Information Management was initiated.

In addition to the listed activities, public outreach in the area of EMS for children included the development and distribution of a parents safety message handout, "What to do if your Child is Missing", in English and Spanish. This is designed to accompany the child ID card currently being provided to young children as a public service by Ventura County Public Health. The card, with photograph and fingerprint, contains emergency personal and medical information. The handouts accompanied the approximately 233 cards that were made and distributed during Public Health Week.